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OPERATIVE GYNECOLOGY

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THE OUTLOOK FOR OVERCOMING PNEUMONIA*

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WITH the great interest which has developed during recent years in the promotion of public health and the reduction of mortality from disease, there has at times tended to be a wide divergence between the outlook of those engaged in the care of the sick and that of those engaged in promoting the health of the community, the physician having his attention fixed almost exclusively on the recovery of the patient under his charge, the public health worker concerned only about the welfare of the entire group, and often uninterested in the diagnosis or treatment of the diseased individual. Fortunately, there is to-day a tendency to change this state of affairs and for the public health agencies to recognize as one of their important functions the rendering of assistance to physicians in diagnosis and treatment, and, on the other hand, for the physician to look beyond the individual patient and be actively interested in reducing the prevalence of disease in the community at large and decreasing the total mortality. It has seemed not unfitting, therefore, to discuss briefly to-night the question of pneumonia in its broader aspects, with the purpose of calling attention to the fact that the solution of the problem of this disease is probably dependent upon the careful study of the individual patient, and upon the most accurate investigation of the details of the infectious process, as well as upon the execution of scientific public health measures by governmental and private agencies.

Twenty-five years ago the attitude of physicians in regard to treatment in pneumonia may

be shown by the statement of Osler in his textbook, that "pneumonia is a self-limited disease which can neither be cut short nor aborted by any known means at our command." At the same time, the attitude of public health authorities toward the possibility of control or prevention was one of profound pessimism. It should be remembered that even then, a marked decrease in the incidence of, and mortality from, many infectious diseases was already taking place, and during the intervening years certain diseases, such as acute infections involving the gastro-intestinal tract, which were then widely prevalent and which annually caused great loss of life, have now ceased to be serious problems. On the other hand, the number of deaths from acute pulmonary infections has not materially decreased. Has no material progress been made in limiting pneumonia during the past twenty-five years, and is the outlook still hopeless? These are the questions which I propose briefly to discuss.

The first great steps in overcoming other infectious diseases have usually depended upon the discovery of methods for precisely delimiting these diseases and for accurately determining their presence or absence in individual patients, or, in other words, upon differentiation and diagnosis. Twenty-five years ago, pneumonia was considered a nosological entity, and the only differentiation was on an anatomical basis. Although it was regarded as an acute infectious disease, frequently but not always associated with the presence of pneumococci, no serious attempts were being made to isolate and identify the particular microorganism concerned in every case of the disease. Indeed, no satisfactory methods were then available for

* An Address delivered before the Montreal Medico-Chirurgical Society on December 15, 1933.

doing this. All pneumococci were regarded as identical, and at this time any classification of the cases on an etiological basis was difficult, if not impossible. We are now in possession of a fairly satisfactory etiological classification, and while it can hardly be claimed that the practice of making diagnoses of these various conditions is generally employed, the methods for doing this have now become simple and rapid and may be carried out with the aid of any properly equipped clinical laboratory. My own clinical training dates from a sufficiently distant past still to appreciate the importance of the location and size of the pulmonary lesion in pneumonia, but it is now apparent that so far as the future outlook for overcoming the disease, either in the individual or the community, is concerned, it is of far greater importance, and much less disturbing to the patient, that in every case of pneumonia the associated microorganism should be correctly determined than that the exact boundaries of the lesion in the lung should be accurately located.

The recognition of the importance of making etiological diagnoses, and the employment of the appropriate methods for doing this, create in the physician at once a new attitude toward acute pulmonary infections. Instead of pneumonia being a single disease, he recognizes a whole group of diseases, each differing essentially from the others. Until the time comes when the physician called to see a patient suffering from an acute pulmonary disease does not rest until he learns the nature of the infectious process, the conditions as regards pneumonia will not differ greatly from those which existed within the memory of the older physicians in relation to infections involving the gastro-intestinal tract, when the term "inflammation of the bowels" or "enteric fever" included all the varieties of dysentery, appendicitis, even typhoid fever, to say nothing of the various kinds of paratyphoid.

A very practical reason exists for the etiological differentiation of cases of acute pulmonary infections, for it is particularly in this group of diseases that the employment of general hygienic measures does not promise to be effective either in prevention or cure, and it seems that if any material progress is to be made in diminishing the frequency of occurrence of these cases, or in improving the outlook for recovery, the methods employed must be based on the

specific immunological properties of the bacteria concerned. The introduction of general methods for preventing the access of infected material to the gastro-intestinal tract, such as supervision of the handling of food, sterilization of milk, improvement in water supplies, training in habits of personal cleanliness, etc., was able greatly to reduce the incidence of gastro-intestinal infections, entirely apart from any measures based on the specificity of the etiological agents. Moreover, the difficulties in preventing the transfer of pathogenic organisms discharged through intestinal excreta were not insurmountable. But analogous methods are not applicable in the case of infections of the respiratory tract. Man must breathe, and the air he inhales cannot be sterilized. Moreover, at least half the persons in the general population are carriers of organisms that are potentially able to cause pneumonia. Every time a person carrying these organisms coughs he emits a visible or invisible spray that infects everything in his immediate vicinity. Campaigns directed against indiscriminate spitting and coughing, and advising against congregating in crowds, may possibly reduce slightly the distribution of these pathogenic bacteria, but it is difficult to believe that these general measures can ever be very efficacious. On the other hand, the infecting agents responsible for pneumonia of certain types have been found to be limited in their distribution very largely to patients suffering from this disease. Shortly after it was discovered that pneumococci are not all identical, but that there are several varieties, it was found that almost half the cases of lobar pneumonia are associated with the presence of pneumococci of two types—the so-called Type I and Type II. Moreover, a survey of the healthy population showed that pneumococci of these particular types were present with the greatest rarity in the mouths of normal persons, and, when they were present, careful investigation showed that in a number of instances the persons carrying them had recently been in immediate contact with patients ill of pneumonia due to pneumococci of the same types. Stillman was able, also, to demonstrate the presence of organisms of Type I or II on soiled articles of clothing and in the dust of rooms occupied by patients suffering from pneumonia due to pneumococci of these types. It has now also been possible to show that a not inconsiderable number of the cases of pneumonia

of these types arise by direct transfer of the infection from one case to another.

Since pneumococci of these two types are rarely found apart from disease, the number of healthy carriers being relatively very few, it is obvious that the incidence of cases of pneumonia due to organisms of these particular types might be diminished were the spread of these organisms from the sick to the well prevented. For many years, all the cases of pneumonia in the Hospital of the Rockefeller Institute have been treated in individual rooms, all nurses and doctors caring for them wear gowns and masks, all dishes and other articles coming from these rooms are boiled, and all secretions from the upper respiratory tract are sterilized. It is obviously impossible, from the limited experience of any single hospital, to form any estimate of the practical value of these procedures. From the laboratory and clinical studies I have mentioned, however, and these have now been confirmed by a large number of observers in different parts of the world, it seems that pneumonias due to pneumococci of Types I and II should be considered communicable diseases, and that patients suffering from these diseases should be isolated, at least during the early stages when they are expectorating large amounts of sputum loaded with these particular organisms. It is possible that by this procedure a noticeable reduction in the number of cases of disease of these two types might be achieved.

IMMUNIZATION AND PREVENTION

During the past twenty years, numerous but not very extensive attempts have been made to reduce the incidence of pneumonia by artificial immunization of groups of individuals against the specific bacteria associated with these acute pulmonary diseases. It is well known that animals, even those most susceptible to infection with pneumococci, may be rendered actively resistant against the homologous organisms by the previous injection of the attenuated or killed bacteria or of certain of their products. The degree of active immunity, however, that may be produced and its duration differ, depending upon the type of the pneumococcus, the methods employed, the ages of the animals, and the species of animals immunized. Studies have recently been made by Ross, which indicate that in rats some degree of active immunity may even result from feeding killed cultures of pneu-

mococci. It is very difficult, however, to transfer the conclusions drawn from studies on one species of animals to those of another species, and the possibility of producing practical results in the immunization of man can probably be determined only by studies on man himself. None of these studies so far made have yielded results that would justify advocating the immunization of large groups of the population as a public health measure. In the case of small groups of individuals especially liable to contract this disease, such as inmates of homes for the aged, or troops in concentration camps, it is not impossible that even with present knowledge something could be accomplished by vaccination. Moreover, the study of improved methods of immunization, of which I shall speak shortly, may possibly yield information which may make vaccination a practical and valuable procedure.

It is possible, however, that the incidence of pneumonia may be reduced, not through specific measures directed toward the agents responsible for the pneumonia itself, but through prevention of the predisposing diseases. With increasing experience, it becomes more and more evident that pneumonia rarely arises primarily through infection with the organisms responsible for the pneumonic lesions, but that for these organisms to induce infection the soil must be prepared, probably by some other less serious infection, usually one involving the upper respiratory tract. The experiences during the Great War taught the importance of measles and influenza in rendering conditions suitable for infection of the lung with streptococci, staphylococci, pneumococci, or other organisms. Careful investigation shows that even in the absence of epidemics, such as those mentioned above, many patients with pneumonia exhibit symptoms referable to the upper respiratory tract for a longer or shorter period before the onset of the disease itself. These symptoms may be those of a simple coryza or common cold, a pharyngitis, disease of the antrum, etc. In over half of a large series of cases at the Hospital of the Rockefeller Institute, the histories mention that one or other of these conditions preceded the pneumonia. Recently, when more attention has been given to the matter and patients have been more carefully questioned, it has been found that this course of events takes place in almost all patients suffering from lobar pneumonia. The old textbook description, of lobar pneu-

monia arising with great suddenness, becoming manifest by a chill in a previously perfectly well individual, must be revised. Pneumonia may arise in this manner, but in my experience only rarely.

Important discoveries have recently been made concerning the common cold and concerning an influenza-like disease occurring in the inter-pandemic period. Dochez, through experiments on chimpanzees and through inoculations in man, has demonstrated that the common cold may be transmitted from individual to individual by means of filtrates of the nasal washings, and these observations have been confirmed by Andrewes and others. It has also been possible to transfer the infectious agent through a series of cultures *in vitro*, and in certain instances multiplication of the virus has apparently occurred.

Very significant observations have been made by Shope during the study of an epidemic disease of hogs, known as swine influenza. He has shown that the typical disease is caused by the combined action of a filterable virus and a bacillus closely resembling the so-called influenza bacillus of Pfeiffer. While the virus alone, or the bacillus alone, may produce certain symptoms, it is only when the hogs are simultaneously infected with both these agents that the typical disease occurs. Very recently, Smith, Andrewes and Laidlaw, while studying an epidemic closely resembling, if not identical with, epidemic influenza, inoculated ferrets with the nasal washings of certain of the cases. After 48 hours the inoculated ferrets became obviously ill and developed fever. From these ferrets other ferrets could be infected and the disease could thus be transmitted through a series of animals. The infectious material passed through a bacterial filter. These studies of Dochez and Shope and Andrewes and their associates seem to show quite definitely that the common cold and certain other diseases affecting the upper respiratory tract are due to infectious agents belonging in the group of filterable viruses. As is well known, these diseases are extremely prevalent. In studies made on a group of students in Baltimore, it was found that each individual suffered each year from an average of at least four attacks of coryza or other mild respiratory disease. With infectious diseases so prevalent, and so mild that isolation is practically impossible, it does not seem that any non-specific

general measures or improvement in personal hygiene can greatly reduce their incidence. While the control of virus disease by methods of immunization offers difficulties, the experience with certain animal diseases indicates that this is not impossible of accomplishment. In any case, knowledge concerning the minor respiratory infections opens the way for a serious attack on the pneumonia problem. The control of these diseases would undoubtedly greatly diminish the frequency of occurrence of pneumonia. In this connection the possibility must be considered of reducing the incidence of pneumonia by observing greater care in the treatment of patients suffering from mild upper respiratory diseases, especially during the early stages. It is becoming more generally recognized that the best place for a patient with a cold is in bed, but whether a sufficient number of healthy-minded people will ever consent to such radical measures so as to materially lessen the number of cases of pneumonia only time will tell.

But even though it is not certain that very important results may be obtained by any methods of prevention now available, it is still possible that improved methods of treatment may result in considerable saving of lives. The treatment of pneumonia may undoubtedly be improved to some extent by non-specific measures. Better nursing, relief of anoxæmia by treatment in oxygen chambers, control of cardiac irregularities by proper use of digitalis, or, according to some clinicians, by discontinuing the use of digitalis altogether, better surgical treatment of empyema, all these, and other general measures directed toward certain symptoms or complications, may have some effect in diminishing the mortality due to this disease, but after a fairly long experience and extended observations in different hospitals and in different localities I am not convinced that the great annual loss of life due to pneumonia is likely to be greatly changed by any such general therapeutic measures. I have become very skeptical of the reports of doctors who have treated a hundred cases of pneumonia with some particular drug or by some special method without a death. Death in pneumonia occurs because pathogenic microorganisms invade the lungs and produce lesions there, and, in a large proportion of cases, because they invade the blood and, before death occurs, produce an overwhelming septicæmia. The growth and multiplication of

organisms in the circulating blood cannot be prevented by digitalis or diathermy or oxygen or mustard plasters.

CHEMO-THERAPY

There is one method which, while it has not yet proved very successful in pneumonia, nevertheless offers possibilities for future development, namely, chemo-therapy. That optochin, or ethylhydrocuprein, has a definite bactericidal effect on the pneumococcus is unquestioned, and that it may under certain conditions have a curative effect in animals is certain. Its undoubted toxic action, which is so unpredictable, and the fact that the organisms during its use may rapidly become "fast," have rendered it of little practical value in the treatment of this disease in man. Nevertheless, the principle is established that an organic chemical compound of relatively slight toxicity may have a definite specific bactericidal effect on pneumococci in the presence of serum, and the limits of discoveries in this field have probably not yet been reached.

SERUM TREATMENT

The other possible method of treatment is to attempt to produce in the body that state which is characteristic of the natural resistant animal, or that which develops in an animal following artificial immunization, or, finally, to try to reproduce the phenomena occurring in man during recovery.

It has long been known that when even such a susceptible animal as the rabbit is given repeated small doses of living or killed cultures of pneumococci, the animal not only becomes resistant to infection with very large doses, but the blood serum of these resistant animals, if given even in very small doses to previously untreated ones, may render the latter temporarily resistant; or, if the serum be given after the infection is already under way it may save these animals from death, may cure them. Following the discovery that pneumococci were not all alike but were of different types, it was found that the preventive and also the curative action of the serum of immunized animals was also type-specific, the serum being effective only against infection with pneumococci of the same type as that of the bacteria employed in the production of the immune serum. At the time these observations were made, the nature of this specificity, or on what it depended, was entirely unknown. Animal experiments showed, how-

ever, that Type I serum was much more effective in experimental infections than was Type II serum, and Type II serum more effective than that of Type III. These studies indicated that a Type I serum of the highest potency then produced might very likely be effective in the treatment of Type I pneumonia in man, that Type II serum was much less certain to have any effect, and that there was little chance that Type III serum could be of any value in saving human lives. The experimental studies all indicated, however, that if the serum, even that of Type I, was to be of any value, it would have to be given in very large doses and probably early during the course of the disease. In the winter of 1912-13, after a method had been devised for distinguishing early in the course of the disease the type of the pneumococcus causing the infection, a small number of patients suffering from pneumonia associated with Type I pneumococci were given intravenous injections of Type I immune horse serum in doses which at that time were considered enormous. A few patients suffering from Type II infection were similarly treated with Type II serum. From the very first, it appeared that the Type I serum was of value, but, even giving the largest doses of Type II serum possible, no definite favourable effects from it could be observed. From that time to this, all patients suffering from Type I infection admitted to The Hospital of the Rockefeller Institute have received this form of treatment, the exact method as to dosage, etc., being based on all available knowledge drawn from experimental studies. The results, as has been pointed out from time to time, have been excellent. It is needless to tell you that the general adoption of this form of therapy has been slow, and that there have been many skeptics. We have, however, steadfastly enlarged our own experience, in the expectation that if the method were really of value its general adoption was only a question of time; if the serum was of no value, this was bound to become evident.

I do not propose to enter into any discussion regarding the exact therapeutic value of the use of serum, above all into a discussion of the exact number of patients in every hundred that may be saved by the employment of serum in Type I pneumonia. This is obviously impossible to determine, since so much depends upon the quality of the serum employed, the amount administered, the time at which treatment is

undertaken, and on the intensity and courage with which the treatment is carried out. At present, it seems sufficient to say that those who have had most experience now agree that immune horse serum may influence the course of pneumonia in man in cases due to Type I pneumococcus. I need only quote the opinion of Dr. Park, who for a number of years was very doubtful concerning the value of this serum, but who now, after directing a study in which serum has probably been employed more widely than in any other series of cases anywhere, says, "I am now convinced that Type I specific serum is almost as valuable in pneumonia due to Type I as antitoxin is in diphtheria." While not willing to subscribe fully to this enthusiastic verdict, I am nevertheless convinced that lives which would otherwise be lost may be saved by the proper employment of Type I serum. All those who have had experience will probably agree that the value of serum treatment in Type II pneumonia is much more doubtful, and there is little evidence that Type III serum is of any use. It is evident, however, that up to the present time the effect of the use of this form of therapy on the total number of deaths due to pneumonia has been very slight. So far, in relation to the total number of cases of pneumonia, it has received very limited application, but it is probable that if the conviction becomes general that immune serum may be life-saving, even though this is true only as regards the Type I cases, its use in some form will noticeably influence mortality rates.

During recent years very commendable efforts have been made to increase the more widespread use of serum. These efforts have been made by two groups, first, by those engaged in public health work, who have been genuinely interested in overcoming the great losses due to this disease, and, secondly, by manufacturers of sera, some of whom, I fear, have not been so disinterested in their motives.

The main objections to the employment of serum therapy in pneumonia, at least in Type I pneumonia, are, first, the considerable cost; second, the technical difficulties connected with the administration of large amounts of serum; third, the possible danger of shock or anaphylactic reactions, and, fourth, the discomfort from the symptoms of serum sickness which occur in a considerable number of cases

during convalescence. The chief method so far proposed for overcoming these objections has been the use of concentrated serum. Two years after the introduction of the method of serum treatment in the Hospital of the Rockefeller Institute, or eighteen years ago, Dr. Avery determined which fraction of the serum possessed the effective properties of the whole serum, and found methods for isolating this fraction. It was found, however, that during concentration the loss of effective substances was so large that it was believed the high cost of production of the concentrated serum would greatly restrict, if not prevent, its general use. Since then various methods of concentrating the serum have been proposed, and some of them have been widely employed. The loss in active substances during concentration probably varies with the different procedures, but is certainly considerable. Dr. Park, who has been a foremost advocate of the use of concentrated serum, states that, "The yield in both the Banzhof and Felton methods is from 50 to 75 per cent of the original amount of antibody." Concentration of serum does not reduce but very greatly increases its cost, provided the dosage is not at the same time diminished, and, so far as our experience is concerned, the dosage cannot be reduced without losing entirely the beneficial results. Unless sufficient serum be administered to attempt to sterilize the blood and to bring about a positive antigen-antibody balance it is very doubtful whether it is worth while to give any. Attempts to render poor serum commercially valuable by methods of concentration, or subterfuges to decrease the actual dosage of antibodies by employing less critical methods of testing, are bound to lead to diminished results in treatment, and are therefore to be condemned.

It is undoubtedly quicker to give small amounts of fluid intravenously than large amounts, and probably causes less anxiety on the part of the physician. Whether the dangers of anaphylactic shock are less with concentrated than with unconcentrated serum is not certain. With proper caution in administration, and with properly prepared serum, the dangers are very slight in either case. Immediate reactions with chill are bound to occur in certain instances, just as they do following transfusions of whole blood. Probably they occur less frequently with the smaller doses of concentrated serum than they do with

the larger doses of the unconcentrated. The published statistics indicate that serum sickness occurs less frequently with concentrated serum. This, while unimportant so far as mortality statistics are concerned, is of significance, since serum sickness is a troublesome and disagreeable complication, and the possibility of its occurrence undoubtedly prevents physicians from employing serum promptly and in all cases.

Concentrated serum, therefore, possesses certain advantages over the unconcentrated. It is possible, as Wadsworth has long maintained, that the whole serum has certain curative properties not present in the concentrated serum, but so far it has not been possible to demonstrate this conclusively. The concentrated serum should only be used in cases where the cost is not an important matter, and when one can be sure that the full dosage of antibodies is being administered. It seems, however, that serum concentration, as at present employed, is not likely to solve the pneumonia problem, even though it bring about a more general use of serum, for if insufficient doses of concentrated serum are used, the results will discredit the method; if doses of sufficient size are given, I fear the cost will prohibit its wide use. It must be remembered, however, that the limits of improvement in the methods of concentration have not been reached. Experimental evidence indicates that the specific immune bodies constitute a very much smaller fraction of the whole serum than has been thought. The present concentrated serum undoubtedly contains a great variety and amount of totally inert substances. Whether it will ever be possible to isolate the active substances in greatly concentrated form, and to do this without great loss and at a minimum expense, is for the future to show.

A second possible method for improving serum treatment is the production of much more active serum. So far, no great progress has been made in this direction, and the best sera now being produced are little better than those originally obtained. It seems fairly certain, however, that the possibilities in this direction have not been exhausted. During recent years much has been learned regarding the nature of the particular pneumococcus antigen which is of importance in the production of immune serum. Formerly, it was assumed that the whole bacterium, when injected into an animal, acted as a stimulus which

resulted in the serum acquiring properties which were inimicable to the life or activity of the bacterium. Now, it is believed that when complex structures like bacteria are introduced into the body, the reacting substances which appear in the serum, the antibodies, are not complementary or antagonistic to the whole bacteria, but that during immunization a whole group of antibodies appear in the serum and that each kind of antibody is complementary or antagonistic to some one of the chemical substances making up the bacterial body.

THE IMPORTANCE OF THE CAPSULAR SUBSTANCE

Certain of the constituents of the pneumococcus cell are now known. The most important, so far as the question of resistance and immunity to the living bacteria is concerned, is the substance known as the soluble specific substance. This substance was first detected in solution in the bacterial culture fluids, and later in the urine and blood of infected animals and of individuals suffering from pneumonia. It was found that when immune serum was added to these fluids this substance was precipitated and that it was type-specific. This substance was therefore called specific soluble substance. Later, it was shown that this substance is present chiefly in the capsules, and that it is constantly being given off by the bacteria, going into solution in the surrounding medium. Avery and Heidelberger and Goebel have been able to separate and to study the specific soluble substances of pneumococci Types I, II and III, and it has been found that they all belong in the group of complex carbohydrates, the so-called polysaccharides. It is upon chemical differences in their capsular substances that the type-specificity of pneumococci depends. It has, furthermore, been possible to cultivate pneumococci so that they grow without producing the soluble specific substance. They then have no capsules. Such pneumococci are entirely without virulence; large numbers can be injected into the animal without any harm resulting. While pneumococci possessing capsules are not attacked by leucocytes, the decapsulated bacteria are readily engulfed and destroyed by them. As has been said, "the virulent pneumococci possess a sugar coating which leucocytes do not like." When the capsular substance in solution is mixed with the homologous immune

serum, some change, probably physical, occurs, and a precipitate forms. It is not known whether an identical or analogous reaction occurs when the soluble specific substance is still attached to the bacterial bodies, but, in any case, on the addition of immune serum to the bacteria, the capsules may be seen to swell and the bacteria then become susceptible to the action of the leucocytes.

It is the presence of capsules that endows pneumococci with virulence, and it is, to a large extent at least, on the specific antibodies in the serum which are directed against these polysaccharides that the resistance to pneumococci and the recovery in pneumonia depend. It is important, therefore, to produce serum that contains these antibodies in a high concentration. This, however, it has not been possible to accomplish. Anti-typhoid serum, which agglutinates typhoid bacilli in dilutions of 1:200,000, or even higher, may readily be obtained. But, so far, it has rarely been possible to produce anti-pneumococcus serum which will agglutinate pneumococci in dilutions higher than 1:100. Moreover, when an animal, such as the horse, receives repeated injections of pneumococci, the concentration of antibodies rapidly rises following the first few injections, and then, with additional inoculations, little or no further increase occurs. It has been suggested, and there is evidence for this point of view, that the antigenic substance is very labile, and that the horse undergoing immunization not only acquires the property of agglutinating the homologous organisms but that it may also acquire the property of breaking down the antigenic material. If this is the case, this material only serves as an antigenic stimulus during the first few injections. Later, when the injections are repeated, the material is immediately changed and no longer stimulates the production of antibodies. It is not impossible, as experimental evidence now indicates, that this antigenic substance may be produced in more stable form, so that it may act as antigen continuously, and therefore sera of much higher titre than any so far produced may be obtained. This would obviously render the concentration of serum unnecessary, and would greatly modify the methods of serum therapy. The production of stable antigens is obviously also of much importance so far as the protective immunization of man is con-

cerned, and might render vaccination against pneumonia a practical and efficacious procedure. On the other hand, although the purified soluble specific substance alone, when injected into rabbits, does not stimulate the production of antibodies, it has been found by Francis that following the intracutaneous injection of very small amounts of the purified soluble specific substance into man specific antibodies appear in the blood. Although no extended studies have so far been made, it is not impossible that this method of immunization may prove to be the one of choice in preventive inoculation.

Knowledge concerning the soluble specific substance has also proved to be of much value in another direction. It has been found that when a minute amount of this substance is injected into the skin of a patient while the patient is still ill, no reaction occurs. If, however, a similar injection is made after the patient has recovered from the acute infection, a reaction in the skin occurs at the site of inoculation within a few minutes, this reaction being of the so-called "wheal and erythema" type. The occurrence of this reaction is apparently associated with, though not entirely dependent upon, the appearance and persistence of homologous antibodies in the blood. Studies made by Francis show that the occurrence of this reaction in a patient suffering from pneumonia indicates that the acute infection has been overcome. In a patient receiving serum treatment, therefore, the appearance of this reaction is of great value as indicating that sufficient serum has been administered. This method is now being employed as a routine measure, and has been found to be of much assistance in serum therapy.

OTHER METHODS OF ATTACKING THE CAPSULE

Since the virulence of pneumococcus seems to depend upon the possession of a capsule, and the action of immune serum apparently is related to the production of a physical or chemical change in the capsular material, it is conceivable that changes in this substance might be produced by the action of agents other than antibodies. For a long time a search was made for a ferment that might attack and decompose the capsular material. At last Dr. Dubos isolated a bacterium from the soil which, when grown in a nutrient-poor medium, but one containing small amounts of Type III

soluble specific substance, acquired the property of breaking down the chemical structure of this substance and destroying its specificity. With considerable difficulty it was possible to separate from the bacteria the ferment on which this reaction depends and to obtain it free in solution. This ferment is specific in its action; it attacks the capsular substance of Type III pneumococcus, but has no effect on the capsular substance of Type II or Type I pneumococcus. By similar methods, it has been possible to isolate from another bacterium a ferment possessing the power to attack the Type II soluble specific substance, but so far its activity is relatively less than that of the Type III ferment.

It was found by Avery and Dubos that the Type III ferment not only attacks the Type III soluble specific substance when the latter is in solution, but that when the ferment is added to a culture of Type III pneumococci the bacteria grow without capsules, the capsular substance being destroyed as rapidly as formed. If the bacteria are transferred to new media containing no ferment, the bacteria again become capsulated. It was next decided to learn what the action of the ferment would be when injected into mice infected with Type III pneumococci. The results were most surprising, for under these conditions it was found that the pneumococci present in the peritoneal exudate lost their capsules and the mice rapidly recovered. It is obvious, therefore, that the ferment is able to produce the same effect within the animal body as it does in cultures *in vitro*, and that, as a result, recovery of the animal takes place. Similar studies have been made in rabbits infected in the skin by the method of Goodner, under which conditions the course of the disease and the progress of the local lesions are in many respects analogous to the course of events seen in man suffering from pneumonia. In these animals, also, treatment with the ferment resulted in a rapid subsidence of the local lesions and the recovery of the rabbits. During the past year, workers in The Hospital of the Rockefeller Institute have made a study of the action of the ferment in monkeys in which lobar pneumonia had been produced by the intrabronchial injection of Type III pneumococci. The publication of this study is now in press, and the results show that under these conditions, also, the ferment has a marked

therapeutic effect. These results are significant in establishing another method of modifying the capsular substance and thus annulling the virulence of pneumococci.

APPLICATION OF OUR KNOWLEDGE

I have referred briefly to these recent and fundamental studies concerning pneumococci and their antigenic properties, as they indicate in no uncertain way that the end of the struggle against pneumonia has not yet been reached. When one contrasts the situation to-day as regards pneumonia with that which existed twenty-five years ago, it is obvious that progress has been made, even though the problem has not yet been solved. Certain steps stand out prominently, such as, first, the recognition of the etiological multiformity of the pneumococci, leading to more accurate diagnosis and differentiation of the various kinds of acute pulmonary infections and increased knowledge concerning transmission of the disease, and, second, the demonstration that at least one variety of these infections may be favourably influenced by serum treatment. Much more important, however, than these observations, the practical applications of which are obvious, is the knowledge which has been obtained concerning the structure of pneumococci and the nature of their immunological reactions, knowledge which has permitted a far clearer insight into the nature of the disease. Exactly how this new knowledge will be effective in controlling pneumonia is not certain, but that it will be of aid can hardly be doubted.

Practical physicians and those engaged in caring for the public health, however, cannot wait for complete knowledge or for ideal methods of prevention and treatment before acting. At any given time we must proceed under the guidance of the knowledge available. The recognition that in many instances, at least, pneumonia, even typical lobar pneumonia, is a secondary disease, and that so far as possible all persons suffering from upper respiratory tract infections should be considered potential cases of pneumonia, and should be protected and guarded against undue exposure and over-exertion, will probably be of value. It is also important that pneumonia be regarded as a communicable disease, since in the case of Type I and Type II infections the infectious agents are limited in their distribution chiefly to the

infected persons and their immediate surroundings.

Pneumonia is not one, but a group of diseases, and with the aid of public health and other laboratories, an etiological diagnosis should be made in every case. Better treatment directed toward the alleviation of important symptoms may accomplish something, but more important in effecting a reduction in mortality is proper serum treatment, especially in the Type I cases. The present methods of serum treatment are not ideal, but results may be much improved by recognition of the importance of early diagnosis and treatment, by the employment of sufficient amounts of serum of high potency, and by continuing the treatment until evidence of recovery is manifested by positive skin reactions following the injection of the soluble specific substance. It is possible that even the general and strict application of all the measures I have mentioned may produce only a moderate reduction in the enormous number of cases and large number of deaths that at present occur in this country. But when we consider the apparent hopelessness of the situation twenty-five years ago, even a moderate degree of control of this

devastating malady should be a source of satisfaction. Typhoid fever was not overcome in a day. Indeed, owing to natural inertia, it is not yet entirely eliminated. Moreover, no single measure has been responsible for the great diminution in the effects of that disease. The fact that new knowledge concerning pneumonia is rapidly accumulating is heartening and should stimulate the energetic employment of the methods which we now possess.

The study of pneumonia by modern methods has been actively pursued for only a relatively short time. We must not expect too much. It is characteristic of youth to be impatient of delays and to desire immediate fulfilment, while old age, which should be more restless, for the time for achievement grows short and "death touches on the shoulder," is more willing to proceed with greater deliberation and to count each step a gain. Possibly, it is significant of my own changing status that I refuse to be hopeless regarding the outlook for pneumonia, and that I still feel that the time may come when acute infections of the respiratory tract will be as infrequent and as harmless as now are infections involving the gastro-intestinal system.

CLINICAL STUDIES WITH THE UREA-CLEARANCE TEST*

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THE NATURE OF THE UREA-CLEARANCE TEST

AMBARD and Weill³ were the first to attempt to relate the excretion and the blood content of urea quantitatively. Their equation gave moderately accurate results for ordinarily low rates of excretion (less than 2 c.c. of urine per minute) but as the urine output increased above this limit the divergence between the calculated and actual figures of urea excretion also increased. Addis and other investigators showed that when the volume of urine excreted is fairly

large the rate of excretion of urea is directly proportional to the blood urea content.^{1, 2, 13, 17} Van Slyke *et al.*⁴ found subsequently that the direct ratio between blood urea content and the rate of urea excretion holds only when the urine volume is above the limit of 2 c.c. per minute (in adults). This limit they termed the "augmentation limit." When the urine volume falls below this level the rate of urea excretion is, on an average, proportional to the square root of the urine volume. On the basis of this and further studies Van Slyke and his collaborators have devised a test which can easily be utilized for clinical purposes.¹⁵ In using this test our procedure has been as follows.

Patients, if not bed-patients, avoided previous exercise and rested prior to and throughout the

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The clinical details of the cases reported in this paper will be dealt with by one of us (L. G. B.) in a separate paper.

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test. They were given a light breakfast (with coffee excluded). One hour later the bladder was emptied completely. (Catheterization was necessary in a few cases, to ensure complete emptying.) A glass of water was then drunk. The time of emptying the bladder (zero time) was noted accurately. Just before the expiry of one hour from this time a sample of oxalated blood was taken from an arm vein, and at the one-hour interval the bladder was again emptied, and the whole sample of urine obtained (Sample I) was kept. A second glass of water was drunk at this stage. One hour later the bladder was emptied, giving Sample II of urine.

Urea-nitrogen was determined in the sample of blood, and urea plus ammonia-nitrogen in the two samples of urine, employing the urease procedure with aspiration. Ammonia-nitrogen was separately determined in the urine samples, and deducted, the difference giving the true urea-nitrogen values for the urine. When the urine volume was below 2 c.c. per minute the *standard urea-clearance* (C_s) was determined by Van Slyke's formula:

$$C_s = \frac{U}{B} \sqrt{V}$$

where U is the number of mg. of urea-N per 100 c.c. of urine, B the number of mg. of urea-N per 100 c.c. of blood, and V the volume of urine in c.c. per minute. When the urine volume was above 2 c.c. per minute the *maximum urea-clearance* (C_m) was determined from the formula:

$$C_m = UV/B.$$

These give the volume of blood *completely cleared* of urea per minute. Van Slyke has shown that the normal standard clearance averages 54 c.c. per minute, and the normal maximum clearance 75 c.c. per minute. His charts¹⁵ were used for the actual calculations, and the results expressed in percentage of the normal values (taken as 100 per cent). Results were separately calculated for each urine sample and the mean taken. Occasionally, the two samples gave figures necessitating the use of both standard and maximum clearance, but unless there was very marked discrepancy between the two urine volumes reasonable agreement was obtained for the corresponding clearance figures.

Potential errors in the method.—Van Slyke excludes coffee from the breakfast, since it is a diuretic. Presumably tea should also come in this category, and Harding and Urquhart⁹ ex-

clude tea, coffee and milk. In one or two of our cases weak tea was not excluded, but it is doubtful if any serious error arose therefrom. The second glass of water (additional to Van Slyke's original procedure) was found to give somewhat better agreement between the two urine volumes. Where the 60-minute interval could not be exactly adhered to in collecting the urine samples, the exact time was noted and used. In a very few instances the second sample could not be voided within a reasonable time and the calculation was then based on the single sample. McIntosh, Möller and Van Slyke¹⁴ extended the method to children and undersized adults by applying a correction for body-surface:

$$[\times 1.73 / (\text{body-surface in square metres})]$$

and this correction has been applied to the few cases of children in our series.

Van Slyke's conception of urea-clearance, as already pointed out, is the volume of blood "cleared" of urea per minute, and in accordance with this view the estimation in urine is of urea, and not of urea plus ammonia. If, however, we accept the current view that the ammonia of urine is formed from urea,¹⁶ then the basis of calculation should be the ammonia plus urea of the urine contrasted with the urea of the blood. It is doubtful if the difference is often significant, judging by the figures from actual cases shown in Table I, but such a modification would certainly simplify the ordinary clinical estimation, since few clinical laboratories will ever employ the gasometric methods of the original procedure.²⁰

TABLE I

Comparison of Clearance Values, Using Urea, and Urea plus Ammonia			
Standard Clearances Based on Urine Urea	Standard Clearances Based on Urine Urea + NH ₃	Maximum Clearances Based on Urine Urea	Maximum Clearances Based on Urine Urea + NH ₃
Percentage	Percentage	Percentage	Percentage
8	8	8	8
15	16	15	16
24	25	25	25
34	36	30	33
52	53	49	56
61	65	62	64
65	67	71	73
72	79	105	118
82	88		
95	98		
118	125		

Were the enhanced values to be employed, of course Van Slyke's standards would also require modification. In determining the results re-

corded in this paper urine-urea values have been employed. As far as our experience goes, in employing the method as a routine clinical procedure the chief source of error lies in wrong timing of the urine samples. Obviously cases in which there is likely to be bladder retention require special attention.

THE CLINICAL APPLICATION OF THE UREA-CLEARANCE TEST

The urea-clearance test shows marked variations with normal persons, so that figures between 75 and 120 per cent have to be regarded as within normal limits. Yet this, alone of kidney functional tests, gives results which can be considered as giving some quantitative estimate of the remaining degree of function in pathological kidney conditions. The test calls for no unusual technical skill, and but little cooperation on the part of the patient, nor does its accuracy depend on that cooperation. From the patient's point of view it is probably the easiest test for the purpose, and even the laboratories of small hospitals should be capable of carrying out the necessary biochemical work.

Van Slyke, Alving and Rose²¹ find that posture and slight exercise do not affect the clearance values of normal persons or of nephritics whose values are above 50 per cent, but when, with resting nephritic patients, the clearance values are less than 50 per cent, if measurements are made when the patients are up and about the values are markedly depressed. On the other hand Bruger and Mosenthal⁵ state that moderate exercise definitely increases the clearance values of normal persons, while low values are not affected in cases of Bright's disease. They state further that not only does a normal person exhibit marked differences of clearance values at different times, but that *single* determinations giving values even as low as 52 per cent do not necessarily indicate diminished renal activity. They agree that values above 75 per cent usually indicate that there is no impairment of kidney function, but consider that 50 to 75 per cent is a doubtful range, and that when figures fall within it other functional tests should also be employed.

Van Slyke and his co-workers²² have compared the urea-clearance test with other kidney functional tests. They found that in patients with diminished renal function the clearance test

shows evidence of this diminution before blood changes in urea and creatinine are apparent or the phenolsulphonephthalein test gives definitely positive results. Usually the clearance test gives values below 50 per cent before other changes are found, and below 20 per cent before all of these are definitely abnormal. (On the other hand, during the recovery period from acute nephritis the dye test sometimes signals improvement much earlier than the clearance test.) Bruger and Mosenthal⁶ are in general agreement with Van Slyke, although they state that in the early stages of renal insufficiency the blood uric acid is occasionally raised before the urea clearance values are definitely low.

The test appears to be equally valuable in all types of cases where there is diminished kidney function, in the various stages of glomerulonephritis, the arteriolosclerotic kidney, and in nephrosis. Cases of acute nephritis may show all stages of low values; the latent stage gives subnormal values, the second stage values above 20 per cent, but falling values, and the terminal stage values below 20 per cent (Van Slyke *et al.*²³). Poulton,¹⁸ comparing the clearance test with various others, considers it the test of choice for accurate work. Harding and Urquhart⁹ carried out a large number of tests on urological cases, with excellent results, especially in indicating the desirability of one-stage or two-stage operation in prostatic cases. They consider that the prognosis is poor when such patients exhibit clearance values below 30 per cent. (Young,²⁴ however, stresses the value of the phenolsulphonephthalein test and considers that it is clinically more useful in urological cases.)

Although Holt¹⁰ believed that the method might have marked limitations in value when extended to children, Schoenthal, Lurie and Kelly¹⁹ have found that when the surface-area correction is applied the clearance test can be safely used, even with infants. They find that in infants suffering from severe diarrhoea and vomiting (intestinal intoxication) the clearance value is often greatly reduced, and, when it can be assumed that kidney lesions are absent, they believe that the reduction is due chiefly to dehydration. Goldring⁸ finds that in the acute febrile stages of rheumatic infection clearance values are usually above high normal, while in the afebrile convalescent period they are below low normal.

Hurwitz and Ohler¹² find values above high

normal in normal pregnancy, normal values in the toxæmias of pregnancy, and decreased values in the acute stages of eclampsia. The high values are presumably due to the low concentration of urea in blood during normal pregnancy. Cantarow and Ricchiuti,⁷ in a more extensive study of 39 cases of normal pregnancy, found that 19 varied from 75 to 120 per cent, and 16 from 50 to 74 per cent. Figures as low as 28 per cent were obtained. The urea clearance tends to drop sharply in the last two or three months of pregnancy and to rise steeply during the first few days after delivery. The low results are attributed to increasing nitrogen retention. Of their abnormal cases 7 patients with chronic glomerulonephritis gave figures ranging from 20 to 51 per cent. They conclude that "the value of the urea-clearance test as an accurate index of renal functional efficiency in pregnancy diminishes as the period of gestation lengthens. Subnormal values obtained during the last two months of pregnancy must be interpreted with extreme caution, particularly in the absence of clinical and laboratory evidence of renal functional insufficiency."

RESULTS OBTAINED IN THE PRESENT STUDIES

Normal cases.—We have carried out tests on 55 patients who were normal to the extent that, clinically, they showed no evidence of damaged kidney function, or any arteriosclerotic condition, of any urological condition, or of any febrile condition. Of this total 50 were within the normal limits of 75 and 120 per cent, 2 were between 64 and 75 per cent, and 3 were above the high normal limit. Those strictly within the accepted normal limits included cases (in the afebrile stage) convalescing from transient infections such as influenza, gastrointestinal cases such as duodenal ulcer, patients with certain neurological conditions such as sciatica, disseminated sclerosis, and brain tumour, a case of hyperthyroidism, several cases of myocardial damage without heart failure, and of afebrile arthritis, and a group of 10 or 12 cases that were essentially normal.

The 3 cases giving figures above normal were one of influenzal pneumonia (175 per cent; blood urea-N 14 mg. per 100 c.c.), one of hyperthyroidism (142 per cent; blood urea-N 14 mg. per 100 c.c.), and one essentially normal and undiagnosed (138 per cent; blood urea-N 17 mg. per 100 c.c.).

The cases giving figures below 75 per cent were one of peptic ulcer, with a clearance of 64 per cent, a blood urea-N of 15 mg. per 100 c.c., and with kidney function normal as checked by other procedures, and one exhibiting a neurosis, but otherwise undiagnosed, (65 per cent clearance; blood urea-N 21 mg.).

Cases of Bright's disease.—Tests have been carried out on 15 cases. Our findings are in complete agreement with those of Van Slyke.²¹ Following the usual classification the series may be subdivided as follows.

Acute nephritis with complete recovery.—2 cases.

1. V.F., male, aged 17. He had had chronic recurrent osteomyelitis of the left tibia, right humerus, and right femur for 8 years. In July, 1932, while in hospital for excision of a sinus, he developed severe headache and malaise with a slight rise in temperature. The urine was found to contain albumin, red blood cells, and granular casts. No oedema was present, but the blood pressure rose to 160/108. On July 8th the urea-clearance value was 51 per cent, with a blood urea-N of 34 mg. per 100 c.c. The urine continued to show albumin, blood, and casts with a relatively high specific gravity (*e.g.*, 1.018). On July 25th the urea-clearance value was 45 per cent, the blood urea-N 27 mg. Subsequently the blood pressure fell gradually to 135/85, but the urine showed albumin, casts, and red blood cells until August 4th, when the albumin disappeared; the sediment gradually cleared of red cells. On August 10th the clearance value had risen to 61 per cent, with a normal blood urea, and the urine was normal. He was discharged well on August 20th. He returned to the Out-patients' Department on September 10th for check-up and at that time the urine showed no abnormality and the urea clearance test was 88 per cent, with blood urea-N of 16 mg.

2. A.H., male, aged 37. Admitted to hospital on November 20, 1932. For three weeks prior to admission he had suffered from a severe attack of tonsillitis, and this was followed in about 18 days by lumbar pain, headache, and malaise, with slight oedema about the face. At that time the urine showed marked albumin and some red blood cells and casts. On admission there was no perceptible oedema. Fundus examination was negative. The heart was not enlarged and the blood pressure was 135/80. The urine showed a definite trace of albumin, 20 red blood cells per high power field, and a few granular casts. The urea-clearance figure was 38 per cent, with blood urea-N 17 mg. A urine-concentration test gave specific gravity 1.015 to 1.017. By December 1st the urine showed only a trace of albumin and no red blood cells, the urea-clearance value had risen to 52 per cent and the patient felt perfectly well. On February 2nd the clearance value was 73 per cent; blood urea-N 17 mg. At this time the urine was entirely negative.

Acute nephritis passing to the second and terminal stages.—1 case.

R.O., a male, aged 24, was operated on for infected antra in June, 1930. Two weeks after the operation he developed progressive oedema of the face and ankles, and noticed that his urine was dark and smoky. He was admitted to the Winnipeg General Hospital on June 21, 1930, with a typical acute nephritis. The blood pressure was 159/94, the urine showed marked albumin and many red blood cells and granular casts, and the blood urea-N at this time was 25 mg. per 100 c.c. He gradually improved until by July 17th the oedema had disappeared

and no blood was present in the urine. From that time until December, 1930, he suffered from recurrent oedema, with massive albuminuria and variable hæmaturia. The blood urea-N remained between 25 and 30 mg. Early in 1931 he improved considerably, the oedema disappeared, and he felt well enough to work. He was not seen again until May, 1931, when he again developed a massive hæmaturia and oedema of the face. At this time a urea-clearance test gave a value of 20 per cent, with blood urea-N 33 mg. His condition showed little change until August, 1931, when the oedema again cleared up and he returned to work. He reappeared in June, 1932. At this time he had no oedema but was suffering from severe headaches. His blood pressure was now 165/100. A marked secondary anæmia was present, and the urine showed a specific gravity fixed at 1.010, a definite trace of albumin, and a few red blood cells. A clearance test on June 14th showed 18 per cent function, with blood urea-N 69 mg. From this time on he presented a classical picture of terminal nephritis, with a rising blood pressure, increasing anæmia, and a steady drop in renal function as measured by the clearance test. In October the value was 12 per cent (blood urea-N 74 mg.). He was not seen again until May, 1933, when he was admitted to hospital in a state of coma and died within a few hours. At autopsy the kidneys presented a typical picture of terminal glomerulonephritis.

Latent stage of nephritis.—1 case.

G., male, aged 28, was first seen in 1927. Three weeks prior to admission he had suffered from a severe tonsillitis from which he made a good recovery. About two weeks later, however, he developed pain in the lumbar region, frequency and generalized oedema, and on examination was found to have blood, albumin and casts in the urine. No record of blood pressure or of kidney function was made. The oedema lasted about two months, but finally cleared up completely; at the time of its disappearance the urine contained a trace of albumin, but no blood.

He was examined in December, 1931, at which time he was complaining of vague pains in the chest, for which no cause could be ascertained. The urine showed a definite trace of albumin at all examinations, but no red cells could be found in the concentrated specimen. There was no elevation of blood pressure or anæmia. A urea-clearance test gave a result of 51 per cent, with a blood urea-N of 20 mg. The test repeated some months later gave an almost identical result.

Chronic nephritis (second stage).—6 cases.

The urea clearances recorded in this group were as follows: Case 1, 50 per cent, falling in 5 months to 34 per cent; Case 2, 26 per cent, changing in 6 months to 34 per cent (it is doubtful if this difference can be stressed); Case 3, 65 per cent, falling in 5 months to 32 per cent (death following, and probably associated with an extreme oedema); Case 4, 66 per cent, falling in 3 months to 16 per cent, Case 5, 54 per cent; and Case 6, 27 per cent. All these cases showed the classical picture of the second stage, marked oedema, albuminuria, and hæmaturia.

Chronic nephritis (second stage passing into the terminal stage).—1 case.

S.C., female, aged 12, was admitted to hospital on July 19, 1930, with generalized oedema, weakness, and vomiting. The history dated back to December, 1929, when there was an insidious onset of oedema, scanty

urine, and weakness, with no definite evidence of an acute nephritis. She had had a varying amount of oedema since that time. On admission she was found to have a generalized oedema. The blood count showed normal values for red cells and hæmoglobin. The heart was normal in size. Blood pressure 112/88. The urine showed massive albuminuria with numerous hyaline and granular casts, but no red cells. Blood analyses gave plasma-albumin 1.83 per cent, cholesterol 362 mg., and urea-N 17 mg. per 100 c.c. She remained in hospital until July, 1930, with little improvement, when she was discharged. She returned to the Out-patient Department in October, 1931, with slight oedema. The urine showed marked albumin and a few red blood cells and casts. A urea-clearance test at this time gave a function of 23 per cent, with blood urea-N 30 mg. By January, 1932, the oedema had disappeared, and the albumin in the urine had lessened considerably, but she now exhibited a slight secondary anæmia (red blood cells 4,000,000; hæmoglobin, 55 per cent) and the blood-pressure was 154/110. She had obviously entered into the terminal stage. By May, 1933, she was markedly anæmic; her blood pressure was now 165/110; and there was considerable cardiac enlargement. The urine showed a specific gravity fixed at 1.010; it contained albumin, a few red blood cells, and granular casts. A clearance test at this date gave the figure 8.5 per cent, with blood urea-N 74 mg. The corresponding figures on November 30 were 8 per cent and 98 mg.

Chronic nephritis (terminal stage).—4 typical cases, admitted to hospital in uræmia and a few days prior to death, gave urea-clearance values of 14, 5, 3.5, and 3 per cent, respectively.

Cases of essential hypertension.—In all, 39 cases of essential hypertension have been examined by this test. These can be divided into two groups, which, for the present purpose, can conveniently be termed *benign* and *malignant*. The "benign" group numbered 20 cases; the results of their clearance tests varied between 42 and 69 per cent. For 16 of the 20 the limits were 54 and 61 per cent. In this group the average age was relatively high—55 years—the extremes being 40 and 66 years. The average history was fairly long, and the symptoms were cardiac or cerebral rather than renal in nature. In none of these patients were the eye-grounds typical of an advanced hypertensive retinitis. In those cases which were followed over some months the urea-clearance remained at the same level. Albuminuria was absent in the early stages, but was often present in slight amount later on, with concurrent slightly depressed clearance values, suggesting that the kidneys were secondarily affected. The essential feature of the group is the very slow progressive change. The case history of a typical patient is given.

Mrs. K., aged 55, was admitted to hospital on January 5, 1932, suffering from severe headache, vertigo and dyspnoea on exertion. These symptoms dated back about 4 years, and had become gradually intensified. In 1929 a systolic blood pressure of 190 had been recorded.

On admission she was found to have a pressure of 230/140. The heart showed considerable enlargement to the left, with accentuation of the aortic second sound. The rhythm was normal. The fundi showed fairly marked arteriosclerosis. The urine showed a definite trace of albumin on all examinations, but was microscopically negative, and concentrated to 1.023. The urea-clearance was 55 per cent, with blood urea-N 23 mg. per 100 c.c. Subsequent examinations over a period of one year gave findings practically identical with those just recorded.

There were 13 cases definitely in the "malignant" group. The initial values of the urea-clearance test varied from 69 to 8 per cent, although only 2 exceeded 39 per cent. The average age of the group was 41 years (extremes, 25 and 62 years). The characteristics of the group were the younger age limit, the short history, the extremely high levels for blood pressure (in most patients the diastolic pressure was over 130 mm.) and the severity of all symptoms, especially those of renal failure. Nine patients showed severe hypertensive retinitis. Practically all exhibited albuminuria; four had hæmaturia. A fairly typical case history is as follows.

K., a Ukrainian labourer, aged 41, came to the Out-patient Department and was admitted to hospital in January, 1931, complaining of pain and swelling of both ankles and of the right elbow. He had suffered from recurrent attacks of pain and swelling in these joints for four years. Aside from these complaints he felt perfectly well, although on direct questioning he admitted that he had suffered from occasional headaches during the previous two years. He had worked hard as a labourer all his life.

Examination revealed swollen joints which were reddened and very painful on movement. The pulse was noticed to be very hard and the peripheral arteries showed moderate sclerosis. The heart was considerably enlarged to the left and a soft apical systolic murmur was present, with accentuation of the aortic second sound. On this occasion the blood pressure was 280/168. The urine showed a specific gravity fixed at 1.010, with a moderate amount of albumin and a few granular casts. The urea-clearance value was 19 per cent, with blood urea-N 43 mg. per 100 c.c. The eye-grounds showed a marked degree of hypertensive retinitis with papilloedema, contracted and markedly sclerosed arteries, and areas of soft white exudate.

He was discharged on February 9, 1931, with a diagnosis of malignant hypertension. He returned to the Out-patient Department on April 6th, when his blood pressure was 230/150, and the urine as before. On this occasion he maintained that he felt perfectly well, and he again disappeared, until June 2nd, when he returned complaining of vertigo and severe headaches. The blood pressure was now 250/162, and the urine showed marked albumin and some red cells. The blood urea-N had risen to 74 mg., with a clearance value of 10 per cent. He was again admitted but after a few days in bed his symptoms cleared up and he left the hospital. During July he felt fairly well, except for occasional headaches. His blood pressure varied between 230/125 and 260/158. On July 21st the urea-clearance value was 8.5 per cent, with blood urea-N 78 mg. At this time he had again developed a severe arthritis of the right ankle, and was admitted for treatment. The joint condition cleared up under heat and rest, but the headaches and dizziness became progressively worse. By August 10th he was

becoming drowsy, and the vision in the right eye suddenly failed. He developed obstinate hiccough and relapsed into a stupor. The blood pressure fell to 140/110, the urinary output fell steeply to 100 c.c. per 24 hours, and he died in coma on August 15th. Autopsy revealed typical malignant nephrosclerosis with arteriolonecrosis, etc.

This case, while not absolutely typical of the group, demonstrates how fulminant this condition can be, while causing few symptoms until the onset of uræmia. Many of the cases showed a combination of cardiac, cerebral, and renal symptoms, but in practically all of them there were very marked evidences of renal damage.

The remaining 6 cases, owing to the indefinite history, could not be definitely classified, but the clinical findings, with usually a urea-clearance of somewhat below 50 per cent, suggested that they might represent the end-picture of the benign type of case.

OTHER CASES

Diffuse nephritis in subacute bacterial endocarditis.—1 case showing typical decreasing renal failure.

The patient was a man of 32 with a long history of repeated attacks of rheumatic fever followed by aortic incompetence. During 1932 he developed fever, weakness, progressive anæmia, and various embolic phenomena typical of subacute bacterial endocarditis. A positive blood culture for *S. viridans* was obtained. When he was first seen the urine contained microscopic blood and a trace of albumin. At this time a urea-clearance test gave the value of 42 per cent, with blood urea-N '33 mg. In the course of three months the urine became loaded with albumin and macroscopic blood appeared. There was progressive renal failure. Two weeks prior to death the urea-clearance figure was 19 per cent, with blood urea-N 42 mg.

Amyloid contracted kidney.—3 cases, showing typical decreasing kidney failure. Details of two of these cases are given.

1. A man of 35 had suffered from recurrent osteomyelitis for 12 years. In 1927 he developed diarrhoea, weakness, generalized oedema and albuminuria. The picture was one of generalized amyloidosis with nephrosis. By October, 1931, the urine showed a specific gravity fixed at 1.010, marked albumin, but no red blood cells. The urea-clearance figure was 19 per cent; blood urea-N 39 mg. The blood pressure was low, ranging from 100/50 to 85/50. During the next three months he went steadily downhill with progressive failure of renal function and died in December, 1931, in uræmia. Autopsy showed typical amyloid disease with contracted amyloid kidneys.

2. A woman of 52 entered the hospital on May 27, 1932, complaining of weakness, recurrent oedema, and diarrhoea of some six months' duration. She was found to have an enlarged, firm spleen and liver, and some oedema. The heart was normal in size; the blood pressure 135/75. A marked degree of luetic choroiditis was present in both eyes. Wassermann, +++. The urine showed on all occasions marked albumin and a few hyaline casts. On June 1st the urea-clearance test gave the value 19 per cent, with blood urea-N 28 mg. A

Congo-red test showed 90 per cent absorption of the dye in 1 hour. The progressive failure of renal function is shown by the following figures:

October 11, 1932. Urea-clearance 15 per cent.

Blood urea-N 45 mg. per 100 c.c.

November 1, 1932. Urea-clearance 11 per cent.

Blood urea-N 43 mg. per 100 c.c.

On November 5th she sank into coma and died the same day.

Acute syphilitic nephritis with recovery.—1 case.

The patient, a man aged 32, was admitted to hospital on November 16, 1932. He had developed a primary chancre six weeks previously, and on admission had a well marked secondary rash. Some oedema of the face had been noted for a few days, and examination of the urine showed an extreme degree of albuminuria with a few casts in the sediment. A urea-clearance test at this time gave the figure 51 per cent, with blood urea-N 21 mg. Treatment was instituted, with rapid disappearance of all the albuminuria and oedema. A clearance test on December 4th gave 90 per cent, with blood urea-N 13.2 mg.

Toxæmias of pregnancy.—4 cases, summarized in Table II.

TABLE II

Urea-Clearance Test in Toxæmias of Pregnancy		
Nature of Case	Urea-Clearance	Blood Urea-N
	Percentage	mg. per 100 c.c.
Pre-eclamptic	63	18
Toxæmia (not eclamptic) ..	74	10
Toxæmia (not eclamptic) ..	75	20
Chorea of pregnancy	65	10

Some unrelated cases.—A case of adrenal cortical tumour with hypertension, which has been reported already by Hunter¹¹ gave a urea-clearance of 44 per cent, with blood urea-N 17 mg. A child with long continued obstruction due to a congenital defect in the urethra gave the figure 9 per cent, with blood urea-N 118 mg. A case of influenzal pneumonia in the febrile stage gave the figure 46 per cent, with blood urea-N 21 mg. and exhibited slight albuminuria. Two cases of congestive heart failure due to rheumatic carditis showed clearances of 66 and 62 per cent, with blood urea-N 15 and 22 mg., respectively. The urine was normal in both cases. One case of severe secondary anæmia gave a clearance figure of 52 per cent, with blood urea-N of 12 mg. When the red blood cell count had returned to normal the clearance figure had risen to 85 per cent.

CONCLUSIONS AS TO THE VALUE OF THE TEST

One of the pleasing features about the urea-clearance test is the agreement on all essential

details amongst those who have published reports concerning its clinical applications. Our results in the nephritic cases are in full agreement with those of Van Slyke; the small group of pregnancy cases gave results in agreement with the findings of Hurwitz and Ohler. Our findings in the series of cases of essential hypertension are those to be expected from present knowledge of the condition of the kidney in this disease.

The results obtained with the test are less dependent on changing conditions, such as oedema, than are those given by most of the other tests of kidney function.

As the number of published cases increases, the value of the test in prognosis in chronic conditions becomes more apparent.

Contrasted with other methods of ascertaining kidney function, the test seems to be the most preferable, because (1) the result given is definite, (2) the result is easily obtained, with relatively small laboratory facilities, and (3) the test eliminates the patient as a source of error.

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PULMONARY EMBOLISM

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FROM the clinical point of view pulmonary embolism is apt to be regarded as of relatively rare occurrence, an untoward event which may occasionally follow in the wake of an operation or childbirth. Experiences at the autopsy table, on the other hand, are in sharp contrast to this conception. Routine autopsies in this department, conducted under the direction of Prof. Oskar Klotz, disclose pulmonary emboli in approximately 10 per cent of adult cases. Most of the cases came from the medical rather than from the surgical services. In a large proportion the emboli are of a size sufficient to be regarded as the immediate cause of death; in the minority they are small and of a non-fatal character (Fig. 1). The majority of these emboli arise from thrombosed veins of the thigh or pelvis which are seldom recognized during life.

Our studies on the problem have convinced us of the necessity of careful post-mortem observations in order to detect pulmonary emboli. Probably there is no other autopsy finding more readily missed. Unless one's attention is particularly directed to the search for emboli many cases will be passed over, and thereby valuable observations are lost. It is only by studying the occurrence of pulmonary embolism under varying conditions and in different types of cases that one can hope to throw light on the underlying causes.

To determine the presence or absence of pulmonary emboli special steps are required in the performance of an autopsy. First, it is of the utmost importance to make a careful examination of the thoracic viscera *in situ*. Before anything is removed the right ventricle and pulmonary arteries are slit open with a scalpel or scissors and any fluid blood sponged out. Emboli of a size to cause death are usually located in the main trunk of the pulmonary artery, and if the heart is removed before the pulmonary trunk is opened the emboli may readily fall out and be overlooked. After removing the heart by severing the great vessels

at the base, the pericardial sac is sponged out and the mouths of both pulmonary arteries examined for clot. When the lungs are removed they are cut open along the vertebral border with a long knife. The cut is made in the direction of the hilus and deep enough to expose the main stem of the pulmonary artery, (Fig. 1). The artery is then opened with scissors on the cut surface of the lung and it may be readily followed to all its finer ramifications. Not infrequently small pulmonary emboli lodge in the finer vessels at the periphery of the lung and these vessels are much more accessible on the cut surface than they would be if the artery were opened outwards from the hilus into the uncut lung. After the removal of the heart and lungs, as an added precaution, the free blood lying in the thorax is searched for evidence of ante-mortem clot. Occasionally one is surprised to find a large embolus which has fallen unnoticed out of heart or lungs on removal. Then the right side of the heart is examined. In two of our cases, a large cylindrical embolus was found tangled in the chordæ tendineæ of the right ventricle.

Sometimes the identification of embolus is not an easy matter. Having located a clot in the pulmonary system the question arises, whether it is of post-mortem or ante-mortem origin and whether thrombus or embolus. Coagulation of blood in the vessels after death or in the tissues or in the test tube presents a fundamental structural difference from thrombosis *intra vitam*, in that the chief constituent of the former is fibrin, of the latter, platelets. This structural difference is reflected in the naked eye appearances. Ante-mortem clot tends to be firmer, less elastic, dry, brittle and rough. If the clot be adherent to the lining of the vessel or if it be of a friable consistency there can be no doubt as to its ante-mortem origin. Not infrequently one must rely on still other criteria. There is a characteristic laminated structure, made up of greyish layers interlarded with red; this feature is lacking in

the post-mortem clot though it may be simulated by the haphazard admixture of white and red elements. Lastly, the ante-mortem clot is often characterized by a rippling of its surface with fine greyish "drifts", like the wavy ribbing of a sandy beach, the so-called lines of Zahn, made up of platelets. This rippling always means that the clot was laid down in a moving blood stream; sometimes, however, the phenomenon may be observed on the surface of agonal clots which have formed during the last

period of life and which must be distinguished from true ante-mortem clots.

It is rarely necessary to employ the microscope to distinguish thrombus from post-mortem clot. In all ordinary cases the distinction may safely rest upon the gross characters of the clot. Microscopically, the post-mortem clot is made up largely of blood cells (red and white) matted together with frail strands of fibrin. There may be small clusters of platelets. The ante-mortem clot on

the other hand has a large platelet content; platelets form the basis of the coagulum, enmeshing variable quantities of cellular elements. If one can detect with the microscope any sign of organization of the clot, the ingrowth of fibroblasts, this is, of course, definite evidence of ante-mortem formation.

Having found a clot in the pulmonary artery and having identified it as of ante-mortem formation, it is not always an easy matter to decide whether it is a thrombus which has formed there (autochthonous) or whether it is an embolus from some distant part. A thrombus of the pulmonary artery starts usually as a mural, plaque-like clot with sessile base and shelving margins, firmly adherent to the intima. It may grow and completely occlude the vessel, but it always conforms to the size and shape of the pulmonary artery, whereas an embolus, on the other hand, having been cast in the shape of some other vessels may betray its foreign origin in a number of ways. It may be riding upon a bifurcation (Fig. 2), or coiled upon itself, and this is particularly true of the long cylindrical emboli which are usually caught in the main trunk of the pulmonary artery (Fig. 3). An embolus is likely to have a number of small twigs attached to it which represent moulds of

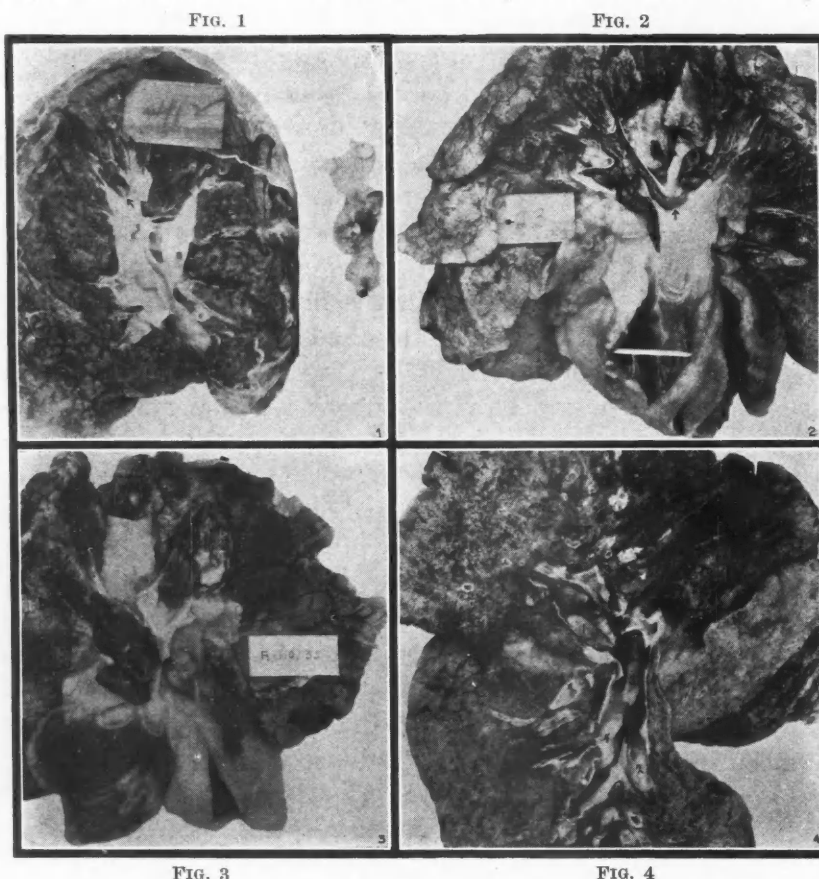


FIG. 1.—Pulmonary artery laid open on the cut surface of the lung, revealing a single, small embolus (arrow) which had arisen from the right iliac vein. The vein is also shown in the photograph; it contains the remainder of the thrombus. In this case the fractured end of the embolus fitted exactly to the end of the thrombus. The embolus had caused an infarct of the lung. (From a case of carcinoma of the stomach, aged 68, with marked emaciation).

FIG. 2.—Lungs and heart from a case of fatal pulmonary embolism. The right ventricle and main pulmonary trunk are laid open, exposing large embolic masses one of which is riding snugly on the bifurcation of the right pulmonary artery. The emboli arose from the femoral veins, both of which were thrombosed. (Male, aged 71, sudden death two days after transurethral prostatectomy. There was moderately advanced coronary disease of the heart).

FIG. 3.—Heart and lungs from a case of fatal pulmonary embolism. The right ventricle and main pulmonary trunk are laid open, exposing a large mass of coiled, worm-like, cylindrical emboli which arose from the femoral veins. There were several small infarcts of the lungs indicating antecedent emboli. (Male, 44, sudden death 12 days following partial gastrectomy).

FIG. 4.—Gross specimen of lung with pulmonary artery laid open, exposing four large emboli. Numbers 1, 2, and 3 are recent arrivals while 4 is of some weeks' standing, now completely organized and fixed to the arterial wall. (Female, 77, dead of coronary disease of the heart. Thrombosis of external iliac vein).

small tributaries of the vein in which the thrombus was formed. An embolus may have a ragged or "fractured" end which will indicate that the clot has been broken off from a larger mass in some other part of the body.

The larger pulmonary emboli are not likely to be confused with thrombi. They usually lie loosely bunched up in the main pulmonary trunk, and they produce death so quickly that they have no time to become adherent to the vessel wall. Smaller emboli, however, often become adherent, form the basis for more clotting, and may then become masked by superadded thrombus or post-mortem clot, or both. It is sometimes impossible to determine whether such a clot is primarily thrombus or embolus. In our experience autochthonous thrombosis of the pulmonary artery is a little less frequently met with than embolism. Some cases regarded as thrombosis may have had an embolic origin.

Often enough one is able to demonstrate pulmonary emboli, but is unable to find their point of origin. On the other hand one is not infrequently surprised to find an undiagnosed venous thrombosis, especially in the leg and pelvic veins, from which no emboli have arisen. Probably venous thrombosis is much more common than can even be determined post-mortem. Thrombosis of the peripheral veins is difficult to detect at autopsy, for the reason that it is impracticable to make a thorough examination of the peripheral vessels, except in rare cases where no restrictions are placed upon the dissection. One is frequently permitted to expose and examine the femoral vein and is sometimes rewarded by the finding of a thrombus at this site. Failing this, each limb may be elevated and massaged downwards, allowing the blood to flow from the cut ends of the large veins in the neck and pelvis respectively. At times this procedure dislodges a thrombus from the more distal veins, but a negative finding cannot be relied upon to rule out peripheral thrombosis.

Occlusion of a pulmonary artery only results in infarction when chronic passive congestion of the lungs is present. Infarction of the lung is, therefore, by no means a necessary accompani-

ment of pulmonary embolism, but the two are very commonly found together for the reason that thrombo-embolic phenomena are frequently observed in cases of circulatory failure in which chronic passive congestion of the lungs is also likely to be present.

In most cases the emboli are multiple and there is usually evidence of them having occurred at different intervals shortly before death. The earlier ones are the smaller and lodge in the peripheral branches of the pulmonary arteries, where they cause small infarcts if the venous return from the lungs is impeded. It is worthy of emphasis that pulmonary embolism, in the majority of instances, is not a single but a recurrent event, with small emboli as forerunners and larger ones as a climax. In one case (Fig. 4) an old organized embolus in the pulmonary artery was found in association with quite recent emboli. From the clinical history it is often possible to relate different emboli to minor attacks occurring shortly before death. These attacks are seldom recognized as due to embolism; more often the clinician puts them down to transitory disorders of the heart. They are characterized by sudden breathlessness and subjective fear of impending catastrophe. In more severe cases cyanosis is recorded as an outstanding feature.

In our cases there is high correlation between circulatory failure and pulmonary embolism. With many other authors we believe that slowing of the blood flow is probably the most important factor in predisposing to the development of the dangerous type of thrombi within the veins.

SUMMARY

Careful autopsy examinations bring to light a surprisingly high incidence of pulmonary embolism. Special care is required in the performance of an autopsy to detect pulmonary embolism, and as it is one of the commoner causes of death it has been thought worth while to describe in detail the methods of searching for and identifying the condition.

BILIRUBIN FORMATION AND THE RETICULO-ENDOTHELIAL SYSTEM*

I. THE KUPFFER CELLS AND THEIR RELATION TO THE RETICULO-ENDOTHELIAL SYSTEM

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THE question of extra-hepatic bilirubin formation has been the subject of many controversies. Older investigators were quite inclined to admit the occurrence of extra-hepatic bile, especially since Virchow,¹ in 1847, demonstrated hæmatoidin, an isomer of bilirubin, in blood extravasates. He concluded that bilirubin may be formed without participation of the liver and may, under certain pathological conditions, even lead to jaundice.

The experiments of Minkowski and Naunyn,² in 1866, led to an almost complete abolition of the idea of an extra-hepatic bilirubin formation. These observers, working on geese, could, after extirpation of the liver, followed by the injection of arsenuretted hydrogen, no longer produce jaundice, which occurred readily as a result of the injection previous to extirpation. Their conclusion, *ohne Leber kein Icterus*, was generally accepted for over half a century.

The recognition of the reticulo-endothelial system as such by Aschoff³ and his pupils, and the demonstration of the function of blood-metabolism in this system, were really the first step to revive the conception of extra-hepatic bilirubin formation. In speaking of extra-hepatic bile formation, the term "extra-hepatic" is used in the meaning of "exclusion of the liver parenchyma"; the Kupffer cells, as representing the reticulo-endothelial system of the liver, normally take part in bilirubin formation. The experiments of Minkowski and Naunyn on geese were repeated by McNee⁴ and others, and, although similar results were obtained, the fact was recognized that one is dealing with an anatomical distribution of the reticulo-endothelial cells in birds entirely different from that in higher animals and man. While in birds the spleen is small and the liver extremely rich in Kupffer cells, the opposite anatomical distribution of the reticulo-endo-

thelial cells obtains in higher animals; that is, a large spleen and liver with a much smaller number of Kupffer cells. The experiments were therefore transferred to higher animals, and here extirpation of the liver could not prevent the development of jaundice after the use of hæmolytic poisons. Extirpation of the spleen, on the other hand, led to considerable delay in the development of jaundice, especially if the Kupffer cells were blocked by a colloidal material. The work of McNee has been confirmed by Lepehne⁵ and many other workers.

Objections may be raised, however, that extirpation of the liver does not permit observations for a long enough period, and the experiments based on blocking the reticulo-endothelial system by intravital storage of colloidal material are not satisfactory, since a complete block of the reticulo-endothelial system cannot be caused for any length of time.

Another unsettled question is the nature of the so-called Kupffer cells. The controversy between Pfuhl⁶ and Zimmermann⁷ gives an idea of the chaotic state of knowledge regarding this. While Pfuhl claims the Kupffer cells to be only thickenings of the endothelial wall, Zimmermann emphasizes their cell nature.

The first problem facing us is, therefore, the nature of the so-called Kupffer cells. Since they are part of the reticulo-endothelial system, a comparative study of the Kupffer cells with other cells of this system seemed to us the most reasonable method of approach. Although the various cell-groups of the reticulo-endothelial system are not quite equivalent, there is a definite relation between them, morphologically as well as functionally.

Our studies have been made on rabbits, guinea pigs, and rats. The animals were injected intravitaly with lithium carmine or trypan blue. Although the lithium carmine was found to be more toxic, it was preferred to the trypan blue, as it gave clearer histological pictures. The rabbits received daily 10 c.c. of a 2.5 per cent lithium carmine suspension for

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five to ten consecutive days; the guinea pigs 5 c.c. for five days; and the rats 1 to 2 c.c. for three to five days. All the injections were given intraperitoneally. The animals were killed by coal gas and sections made of the organs to be investigated. With the exception of the bone marrow, which was fixed in Zenker's fluid, the tissues were hardened in formalin, passed through alcohol and toluol, and paraffin sections cut. The carmine sections were slightly counterstained with hematoxylin and the trypan blue sections with Bismark brown. Some of the liver-sections were also stained by Hortega's silver carbonate method.

In the sections of liver the Kupffer cells were quite numerous, occurring in the sinusoids from the periphery of the lobule right to the central vein. They were large and rich in protoplasm. A nucleus could be recognized in each and the carmine granules could be seen in large numbers in the protoplasm. The shape is variable, star-forms being common. One could see that the cells were free in the lumen of the sinusoids, surrounded on all sides by the blood-stream, but attached to the wall here and there; sometimes they were very close to the side of the sinusoid. Fig. 1 shows a sinusoid with two Kupffer cells (k). Both cells have stored a considerable amount of carmine. One can see that there is a definite space between the cells and the wall. Occasionally very fine protoplasmic processes could be seen, especially in the silvered sections which show the finer details, but the carmine was unfortunately almost entirely obscured by the silver. These observations confirm those of Zimmermann.

If we compare the sections of liver with other cell-groups of the reticulo-endothelial system in sections of the spleen, bone-marrow, or omentum, we find a similar storage of carmine granules in them. Fig. 2 is from the spleen of a rat in which carmine can be seen stored in a

fashion similar to that in the Kupffer cells. So far as intravital storage is concerned, there is no difference in the behaviour of the Kupffer cells and other cells of the reticulo-endothelial system.

Six rats were injected with carmine about two months after splenectomy. In the sections of liver of these animals a great proliferation of the Kupffer cells is noticeable. Fig. 3 shows an average field of a section of a normal rat liver and Fig. 4 one from a splenectomized rat.

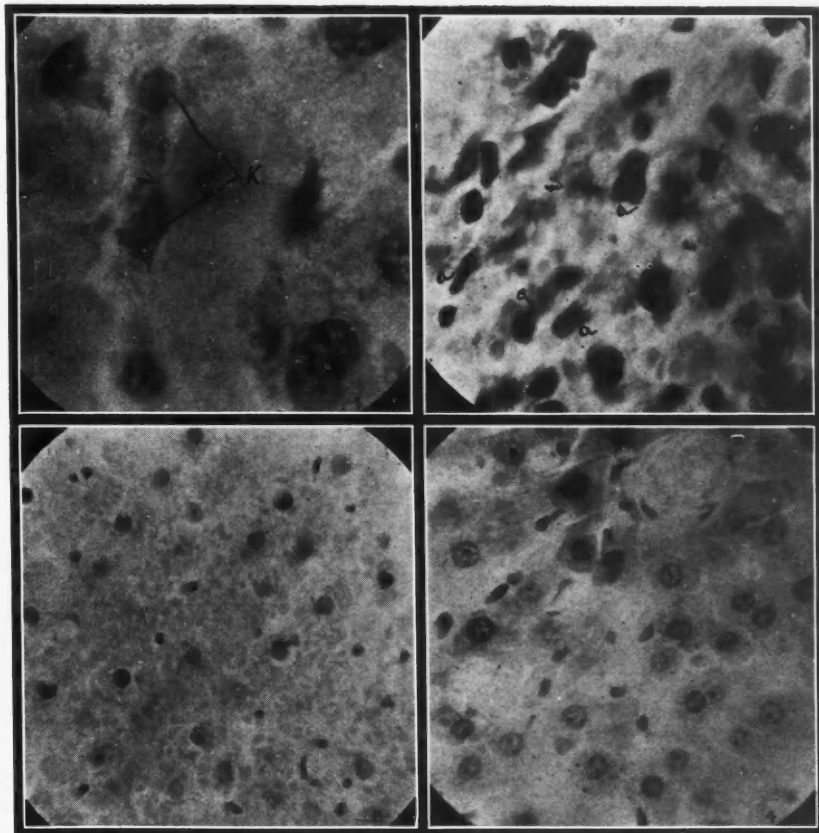


FIG. 1.—Section of a rat's liver. K, Kupffer cells in a sinusoid; carmine granules in the protoplasm.

FIG. 2.—Section of a rat's spleen. Carmine granules in the protoplasm of the cells marked a.

FIG. 3.—Section of rat's liver (low power).

FIG. 4.—Section of a rat's liver after splenectomy. Note increase in number of Kupffer cells in spite of higher magnification, as compared with Fig. 3.

Although Fig. 4 is made with a higher magnification the increase in the number of Kupffer cells is striking.

Direct observation with the microscope of reticulo-endothelial cells in the living animal was then attempted, but it proved technically impossible to study the Kupffer cells under these conditions. The reticulo-endothelial cells of the omentum (the clasmatoocytes), however, could be observed for hours at a time. Twelve rabbits were used for this. The animals were

anæsthetized with sodium amytal, the abdomen opened, and a piece of omentum placed on the object table of the microscope. A constant flow of Simmel's saline solution at body temperature kept the tissue moist and warm. From 3 c.c. to 5 c.c. of the lithium carmine suspension were then injected intravenously into the ear vein, or, alternatively, 10 c.c. of lithium carmine suspension were brought into contact with the omentum for 10 minutes and the excess then washed away with Simmel solution. Observations could be made for from two to four hours. About 30 minutes after the injection, fine carmine granules could be seen on the surface of the clasmotocytes; gradually the protoplasm of these cells ingests these granules and they then appear within the protoplasm. The granules are best seen near the origin of the long protoplasmic processes of the clasmotocytes. The cells which have stored carmine granules look somewhat swollen; we believe, however, this to be an active functional change in the shape of the active cell. At the same time a considerable amount of carmine passes through the capillary walls and stains the connective tissue diffusely. Although the clasmotocytes are by no means equivalent in their function to the Kupffer cells, they have one thing in common, namely, intravital storage. We believe, therefore, that we can assume a similar process of active storage in the Kupffer cells, as we have observed in the clasmotocytes.

Concluding, we may say that we believe, with Zimmermann and others, that the Kupffer cells are true independent cells which are suspended in the liver in such a manner that they are well surrounded by the blood stream. They are nucleated cells attached to the wall by protoplasmic processes only; functionally, they are able to store intravitaly like all the other cells of the reticulo-endothelial system. Even if the existence of the reticulo-endothelial system as such be called in question, there remains the fact that a number of groups of cells of mesodermal origin are capable of storing carmine intravitaly. It does not appear reasonable to exclude the Kupffer cells alone and deny their cell nature, as it is assumed by Pfuhl and his school.

The proliferation of Kupffer cells after splenectomy is another fact of importance. One could hardly expect mere thickenings of the endothelial wall to proliferate on account of an increased functional demand.

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EFFECT OF VACCINATION WITH BCG ON CHILDREN FROM TUBERCULOUS FAMILIES.—The investigations of Park, Kereszturi and Mishulow, reveal that BCG is so attenuated that even under the most favourable conditions of artificial cultivation it is difficult to increase its virulence to any degree. During the past five years, the virulence of the BCG vaccine was tested on 165 rabbits and 194 guinea-pigs, but no evidence was found of any increase in virulence. Twenty cultures of acid-fast bacilli that were recovered from the cold abscesses of 17 children after a stay in the body of from one to six months showed no increase of virulence, but remained like the BCG in colony morphology and were non-virulent for rabbits and guinea-pigs. One culture was recovered from the mesentery of an orally vaccinated child six weeks after vaccination. This culture showed no increased virulence and culturally was typically like BCG. The pathological material that was obtained from children who were vaccinated with BCG and died of other infections showed no evidence that BCG tended to increase in virulence during its residence in the human body. The authors state that slight primary tuberculous infection acquired by natural infection or produced by vaccination does not diminish resistance

to future superinfections by tuberculosis. Children of tuberculous families vaccinated orally with BCG show lower mortality from tuberculosis than corresponding controls. None of the parenterally vaccinated children died of tuberculosis, whereas the children who were not vaccinated and were similarly exposed showed about a 3 per cent mortality from tuberculosis. There was no appreciable difference in the mortality of the controls who presented negative roentgenograms of the chest when they were first seen, whether they gave negative or positive initial tuberculin tests. Tuberculin tests performed on 148 non-vaccinated children followed up since birth and on 205 children orally vaccinated with BCG before their tenth day showed, during the first two years of life, from 20 to 40 per cent more positive Mantoux tests among the latter cases. The allergy produced by BCG apparently does not usually last for more than two or three years. Comparatively few of the control children developed positive reactions to tuberculin, even when they were more or less exposed to open tuberculosis, i.e., 20 per cent in the first year and 50 per cent up to the fourth year. If repeated tuberculin tests are performed through the years, a small percentage of the slightly or moderately positive reactions become negative.—*J. Am. M. Ass.*, 1933, 101: 1619.

VOLUMINOUS ORBITO-CRANIAL OSTEOMA; CONSECUTIVE CEREBRAL ABSCESS OF NASAL ORIGIN

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IN 1930⁵ I published the case report of a young girl who consulted me for a large osteoma of the orbit, which was removed without enucleation by a supraciliary incision, and conserving to the interested eye its entire physiological function. Besides this tumour, my patient presented on the corresponding side a peripheral facial paralysis, and, by elimination of the possible causes, I classified this affection, which was cured within four months, as being *a frigore*. The ethmoid bone had been the point of origin of the neoplasm, and, in spite of its radical removal, a relapse occurred at the same place a few years later. The particular interest of the present report is that this time the osteoma, originating in the ossification of an initial fibroma, had at first invaded the orbit, that afterwards it extended to the cranial cavity, that it spread infection to the brain, and that during operation I discovered a vast abscess of the frontal lobe. Considering these facts, and basing myself on the medical literature perused, I believe that this is the first case ever published on such a subject. The patient died of diffuse leptomeningitis twenty-eight hours after operation.

CASE REPORT

Miss C.N., aged 24 years, was admitted to my service at the Notre-Dame Hospital, on January 26, 1933, for trouble in the right oculo-frontal region. This patient, from whom I had already removed an osteoma of the orbit weighing twenty-eight grams, on May 8, 1925, related that since the operation she had enjoyed excellent health until October, 1931. She had noticed from this time a sensation of fullness in the orbital cavity, without any pain. The eye was projected forward very slowly, but the vision remained good, and she had never noticed diplopia. Headaches, localized to the right and starting from the frontal region, appeared in about one month.

Examination.—There was a slight direct exophthalmos of the right eye, which nevertheless was quite mobile. The lids exactly covered the cornea, whose sensibility was perfect. The pupil reacted well to light. There was epiphora, but the lachrymal ducts were permeable. The papilla was normal; so was the fundus of the eye. With Rémi's diploscope I noticed a good fusion of the images. Nothing interesting was found in the left eye, and vision of both eyes was 1/3, though after the correction of a mixed astigmatism it rose to 2/3. O.D. 105° + 2.25 - 0.75; V = 2/3; O.S. 120° + 2 - 0.50; V = 2/3.

The right orbital roof was painful on pressure, and a neoplasm could be felt on moving the globe downwards. The patient complained of headaches localized to the frontal region of the corresponding side.

On anterior rhinoscopy I found a right nasal fossa without pus, absolutely free, but presenting anosmia. There was a slight spur of the septum to the left. On this side the sense of smell was normal. The pharynx and the cavum offered nothing particular. All the sinuses of the face were quite transparent on diaphanoscopy.

In the presence of exophthalmos in this patient, who had already been operated on for an osteoma, I immediately thought of a recurrence, and asked for a roentgenogram. Dr. Laquerrière gave me the following information.



FIG. 1.—Orbito-cranial osteoma.

“Radiogram of the face: complete opacity of the right orbit; corresponding frontal sinus, normal.

“Radiogram of the profile: a nodular bony tumour, larger than a large nut, localized anteriorly in the posterior part of the orbit, and posteriorly in the cranial cavity.” (See Fig. 1).

Progress.—The patient having a temperature of 102.4° F. was immediately ordered to bed, and she was told that before removing the tumour it would be necessary to enucleate the eye, and that operative intervention might entail serious consequences. She therefore, asked to be allowed to consult her family. During the following days, the symptoms grew considerably worse. Indeed, headaches became more intense, the temperature oscillated between 97 and

100° F., and she had vomiting. From time to time she was somnolent. On lumbar puncture we obtained a clear liquid under no pressure. Analysis of this gave the following:—lymphocytes, normal; bacteriological examination, negative; albumin, gr. 0.60; gum mastic test, negative. The blood Wassermann test was negative, and the urea was normal. Traces of albumin were found in the urine, and there was no sugar.

During the second week after admission the nervous troubles increased, and headaches became more severe and persistent. She presented always a little hyper- or hypothermia, accompanied by somnolence. Nevertheless, the papillary disks were not choked, and vision was well maintained.

On February 9th, I again advised intervention, and this time it was decided that it should take place on the following day.

Operation.—In view of the apathy manifested by the patient, the anaesthetist administered rectally 6 c.c. of avertin, which produced an ideal sleep. I performed an external canthotomy, followed by an enteration of the orbit. I then discovered a nipped osteoma filling the whole of the superior half of this cavity. By its adhesions, it was easy to conclude that

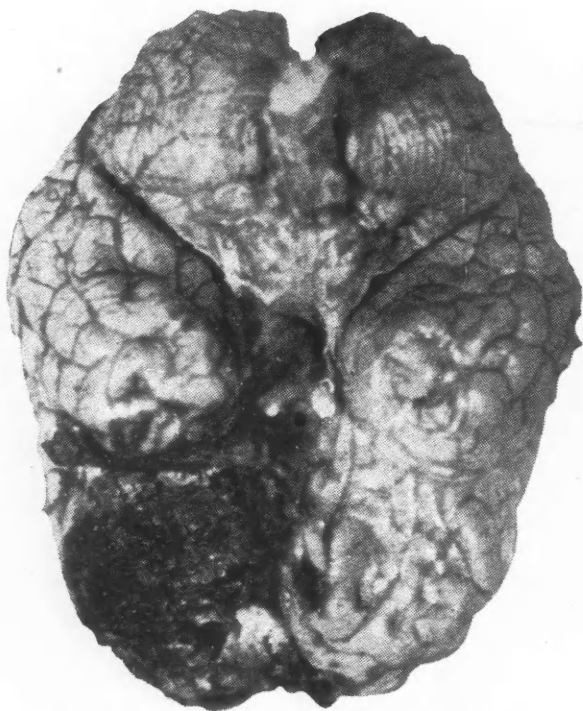


FIG. 2.—Abscess of the right frontal lobe.

the neoplasm had its origin in the ethmoid bone. Using the gouge and mallet, I freed its nasal attachment. As the tumour was spongy in certain places, and because I was afraid of fracturing the thin walls of the orbital cone in attempting to remove it completely, I parcelled it with a cutting forceps. I loosened with great care its cranial part with a lever, once I arrived at the bottom of the cavity. During these manœuvres my surprise was great when I saw flowing out from the frontal lobe about 20 c.c. of pus. Needless to say, the last portion of the osteoma was removed with as much care as possible so as not to disseminate the infection. The operation, which had presented no difficulty, was finished by placing a few sutures at the external canthus, by drainage of the abscess, and applying an aseptic dressing. Though the loss of blood was very small, I prescribed 500 c.c. of glucose-saline intravenously, and 2 c.c. of coramine intramuscularly, in order to moderate the shock produced by the operation. The awakening was normal,

and the following night sleep was calm. However, the next day, the patient complained of headaches, had incontinence of urine and vomiting. Fever reappeared and gradually increased. She became unconscious in spite of all the stimulants administered, and began then to be delirious. The breathing rose to 40, the pulse to 160, and she died twenty-eight hours after the operation with a temperature of 103.1° F.

The autopsy, performed by Associate Professor Simard, permitted us to make, among other things, some very interesting observations on the orbito-cranial region.

"The cadaver is that of a young woman well built but emaciated. The right eye is absent, as well as the orbital roof. The orbital cavity is filled by a clot of blood which is continuous with another clot adherent to the right frontal lobe of the brain. The right frontal sinus is intact.

"On the inferior side of this lobe there is a loss of substance, in the form of a cupola, 4.5 cm. in the transverse diameter, 4 cm. in the antero-posterior direction, and 2 cm. deep. This loss of substance is replaced by a red blackish mass, streaked with grey bands, which is continuous with the clot of the orbit. The bulb and the olfactory nerve of the same side are destroyed. The borders of this cupola, with the microscope, are composed of disintegrated cerebral tissue, strongly infiltrated with red corpuscles. The bottom is carpeted by a purulent layer. There exists, moreover, a diffuse leptomenigitis." (See Fig. 2).

The fragments of the tumour when reunited weighed 43 g., and, from the microscopic point of view, it was nipped in the orbit, as well as in the cranial cavity, presenting at certain places spongy parts and elsewhere very hard ones. Prof. Pierre Masson, who made the examination of a piece of the neoplasm grown into the skull, gave me the following report. "The tumour is hemispherical in shape, and is amalgamated with the orbital roof. It is very hard, and had to be divided into slices with a fine saw. It contains two regions of different structure. One, external or cortical, formed by a very compact bony tissue having narrow Haversian canals and resembling that of the diaphysis of a long bone; the other, deep, is formed by tissue of variable structure. This tissue is fibrous in places, very dense, and has large capillary vessels running through it. Elsewhere osteoid trabeculae spring up in places. These osteoid trabeculae are continuous externally with the compact bone which forms the superficial region of the tumour. Between these young trabeculae, there exists only fibrous tissue and vessels; no red marrow. The bony tissue seems to be altogether stable in the compact region. The Haversian canals are not bordered by osteoblasts in the order of epithelioid arrangement—a sign of bony increase—nor by myeloplaxs included in the Howship's lacuna—a sign of resorption. We find pictures of increase and resorption (these very rare) only in the deep region.

"This tumour is a pure osteoma originating in the direct and progressive ossification of an initial fibroma. In no place did the tumour present, either on its surface or in its interstices, the least inflammatory lesion."

In weighing the facts revealed in this case, I shall avoid repeating as much as possible what I have already said in the publication of my first paper, though, I shall recall that my patient never had formerly any infection of the nose, that she never received any trauma on the naso-frontal region, and that her orbital osteoma had sprung from the ethmoid bone without any apparent cause. This tumour, par-

ticularly hard, had been totally removed in 1925. Desirous to know then its imperviousness to the x-rays, I had it radiographed with the head of a small statue in ivory, of a size relatively equal to the neoplasm, which gave the same opacity for the two objects. (See illustration⁶).

From the history of the patient, cure was maintained for six years, although, it would be logical to believe that relapse had begun before October, 1931, and that the first manifestations had passed unperceived. As we all know that osteomas of the orbit have a rather slow evolution, the neoplasm in this patient would have attained with difficulty a volume of 43 g. in the space of sixteen months.

The anatomo-pathological examination has furnished information of a special interest. Indeed, it has been demonstrated that the tumour, developed on the old cicatricial tissue of the ethmoid bone (an observation made during operation), had at first been a fibroma, which, in process of time had progressively undergone ossification. Contrary to what I had found during the first operation, where the osteoma, very hard, had invaded the orbit, pushing the eye forward, its relapse offered a consistently semi-spongy and somewhat ivory-like mass, prolonging itself in depth in the cranial cavity, with only slight exophthalmos.

Let us see now in what manner the brain has been infected. On x-ray examination, and especially at autopsy, the frontal sinus corresponding to the tumour was found absolutely normal. We must then conclude that the microbial agent had its point of departure in the nasal fossa, and that it slowly reached the meninges, by the posterior way of the neoplasm, most probably. If the patient had never shown signs of a retrobulbar abscess, it was because the infection, chronic at first and, with a very slow evolution, never manifested itself under an acute or subacute form, consecutively to a severe rhinitis, for example. Though the fragment of the intra-cranial tumour examined under the microscope did not show any sign of inflammation, this fact does not weaken the hypothesis that the microbes coming from the nose had proceeded to the brain by the cortical part of the osteoma. The cerebral pulsations, transmitted to the meninges in contact with this, had produced in time an erosion of the dura mater, by which infection then propagated itself to the frontal lobe. It would not be reasonable to suppose

that the microbial agent had followed the cribiform plate of the ethmoid bone to reach the brain, because the patient, since her first operation, never had ethmoiditis, because at my examination the right nasal fossa was normal, and because at the autopsy no pathological finding was observed in the region of the crista galli apophysis.

I regret not being able to furnish a microscopic report of the pus evacuated from the abscess of the brain. However, the virulence of this pus was very marked, since twenty-eight hours after operation the patient died with a temperature of 103.1° F. Moreover, Associate Prof. Simard, who studied the cerebral sections limiting the abscess, found that this tissue was disintegrated and strongly infiltrated with red corpuscles, that it was carpeted with a purulent layer, and finally that there existed a diffuse leptomeningitis.

At the time of the clinical examination, I observed that the right nasal fossa, although quite free, presented anosmia, but the sense of smell was normal on the left. This phenomenon is explained by the destruction of the bulb and olfactory bundles consecutive to the abscess of the corresponding frontal lobe.

I shall underline the fact that, in spite of the fairly considerable development of the cranial osteoma, the papillæ, on ophthalmoscopic examination, were not choked, and that, on lumbar tapping, the liquid escaped without pressure. Moreover vision of the right eye had always remained good, since the orbital neoplasm had solely invaded the superior part of this cavity without coming in contact with the optic nerve.

The clinical symptoms and the x-ray examination did not allow me to make a diagnosis of an abscess of the frontal lobe, for the headaches at this region could well be due to the tumour, and the rise of temperature, as well as vomiting, to a reaction of the meninges. Though, if I had thought of such a complication—observed for the first time—it would have been instructive to see what ventriculography would have shown.

SUMMARY

1. This patient had been operated on radically in 1925 for an osteoma of the orbit, having the consistency of ivory, which developed on the ethmoid bone.

2. Cure was maintained apparently until 1931.

3. From this time a relapse manifested itself under the form of a fibroma starting from the nose.

4. This initial fibroma underwent ossification.

5. The tumour invaded at first the superior half of the orbit and then the cranial cavity.

6. The nasal infection propagated itself by its intermediation to the brain.

7. During the operation an abscess of the frontal lobe was discovered.

8. Finally, the patient died of diffuse leptomeningitis twenty-eight hours after intervention.

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MESENTERIC CYSTS; WITH THE REPORT OF A CASE*

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THE subject of mesenteric cysts has recently been brought up to date by Warfield¹ and Peterson.² Warfield found 129 cases reported in the literature between the years 1920 and 1932. Before that time between 200 and 300 cases were reported, bringing the total up to about 400. These figures would indicate that mesenteric cysts are not so uncommon as the standard text-books of surgery would lead one to believe.

The etiology and classification of mesenteric cysts have been much confused. At first they were considered anatomical curiosities. Dowd³ in 1900 was one of the first to suggest their origin from embryonic "rests". His classification was embryonic rests of tissue, hydatids, and malignancy with cystic degeneration. Warfield states in his review of the cases in the literature that most of them can be classified etiologically into one of two chief groups: embryonic retroperitoneal rests of tissue, such as germinal epithelium, ovary, Wolffian and Müllerian bodies, or displaced intestinal tissue sequestered from embryonic intestinal diverticuli or from the vitelline duct. He also lists six other etiological factors which occasionally occur; dermoid inclusions, angiomas, parasitic and bacterial infections, necrosis of lymph glands or solid tumours, trauma or foreign bodies, and lymphatic obstruction. Mesenteric cysts are more common during the fourth

decade of life, although cases have been reported at all ages from infancy to old age. The proportion of males to females is two to one. The cystic tumour is more commonly found in the mesentery of the ileum, although scattered cases have been reported which occurred in the mesentery of other portions of the small intestine. The contents of the cysts vary with the age of the cysts and the accidents which have befallen them.

There are no constant symptoms or signs of these cystic tumours, and very few are correctly diagnosed before operation. The symptoms and signs which occur most often are vague abdominal pain, intestinal obstruction, vomiting, and a palpable tumour.

The treatment is always surgical. Warfield suggests three procedures, the choice depending upon the conditions found at operation. Enucleation of the cyst is the method of choice when possible. The mortality rate for this operation is 9 per cent. Resection of a portion of the intestine, its mesentery, and the cysts is often necessary when the cysts are large or multiple or when there has been an interference with the blood supply of the intestine. The mortality rate is 27.3 per cent. Drainage or marsupialization can be used in cases with large cysts and many adhesions. The mortality rate is low when this method is used; Peterson used it in two of his cases, with good results. The diagnosis is seldom made early enough for enucleation to be possible, because of early interference with the blood supply of the intestine.

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CASE REPORT

The following case (Hospital number 7823-33) was that of an Italian boy, aged eight, who was admitted to Dr. Alton Goldbloom's service at the Children's Memorial Hospital. It is of interest from the standpoint of diagnosis, treatment, and the pathological findings.

History of illness.—The parents stated that the boy had never been well, but there were no definite symptoms until 1929. At that time he visited the Outdoor Department of this hospital because of constipation and vague abdominal pain. A few weeks later he had an appendectomy at another hospital. The gross diagnosis at the time of operation was, "Acute appendicitis and peritonitis, probably tuberculous." No pathological examination was made of the appendix. From that time until November 20, 1932, (three years) he had no abdominal pain, but his appetite was poor and he failed to gain weight at a normal rate. On November 21, 1932, while attending school, he developed abdominal pain which was steady and severe but not localized. A few minutes after the pain began he vomited. During the next twenty-four hours he was feverish and vomited several times. The following day vomiting ceased, but the abdominal pain persisted, although it was less severe and never localized. There was some anorexia but no other symptoms.

Past medical history.—The child had measles at three years of age, but all other illness was denied.

Family history.—Unimportant.

Physical examination on admission to the hospital, November 28, 1932, showed a slender boy lying in bed with his knees flexed, apparently suffering considerable pain. The temperature was 99°, the pulse 108, and the respirations 20. There was nothing significant in the examination of his head, neck, heart, glandular system or extremities.

The abdomen was distended, but not tender or rigid. The liver and spleen were not palpable. There was an egg-shaped tumour in the lower abdomen which extended from the symphysis pubis to the umbilicus. This tumour was smooth in outline, except at its upper end where a nodule was noted. It was not attached to the anterior abdominal wall and was movable from side to side, but not from above downward. There was dullness to percussion over the tumour and some fluctuation. Catheterization did not reduce the size of the mass. Rectal examination revealed a soft, cystic mass in the right fossa which was very slightly tender on palpation.

Laboratory findings.—Blood: red blood cell count, 2,800,000; white blood cell count, 10,000; hæmoglobin, 65 per cent (Sahli). The differential blood count showed polymorphonuclear leucocytes 74 per cent and lymphocytes 26 per cent. The blood Wassermann test was negative. The urine was normal. The vomitus contained no blood.

X-ray examination.—"Flat plates of the abdomen are negative. Cystogram shows no evidence of diverticulum of the bladder, but there is some indentation of the superior aspect of the bladder. A barium enema shows a sigmoid colon flexed to the right, which proceeds upward and turns over to the left, then crosses the midline at about the level of the third lumbar vertebra and proceeds to join the ascending colon. This displacement corresponds to the position of the mass. There is no evidence of obstruction or diverticulum of the portion of bowel examined. Uroselectan, intravenously, shows both kidney pelvis well outlined and normal, with no displacement of either ureter. The chest plates are negative."

Operative report.—"Through a midline incision extending from one inch above the umbilicus to the symphysis pubis, a large thick-walled cystic mass was exposed which could not be delivered through the abdominal wound. After packing off the abdominal cavity the cyst was aspirated, and 600 c.c. of an amber-coloured fluid obtained. This permitted the cyst to be delivered, exposing another bilateral cystic tumour occupying the whole of the left upper quadrant, extending over to the right beyond the midline, and downward into the left

lower quadrant. This cyst was thought to arise in the mesentery, with its wall not unlike bowel in appearance. It was also necessary to aspirate this cyst before removal: 700 c.c. of a chylous fluid was removed. Following aspiration, the cysts could be delivered on the abdominal wall, together with about seventeen inches of jejunum. These two cysts arose from the same region of the mesentery, almost obliterating the latter. The cysts were closely adherent to the bowel, but did not communicate with it and were lying about eight inches below the duodenal jejunal junction. There were several other smaller cysts closely adherent to the larger ones described. It was impossible to enucleate the cysts, so that fourteen inches of small bowel with its associated mesentery were resected. End-to-end anastomosis was carried out with a double layer of Lembert sutures, the borders of the mesentery were drawn together by two catgut sutures and the abdominal wound closed. The condition of the patient was good at the close of the operation."

Following operation, the child vomited a few times during the first forty-eight hours, after which he steadily improved. He was discharged from hospital on December 24th, with his wound healed and symptom-free. He was seen three months later, still symptom-free and gaining weight.

The fluid obtained from the cysts was analyzed by Dr. I. M. Rabinowitch, with the following result.

	Chyle-like fluid	Amber-coloured fluid
Specific gravity ...	1.016	1.019
Water	94.3 per cent	94.3 per cent
Solids	5.7 " "	5.7 " "
Combustible matter .	4.9 " "	5.4 " "
Ash	0.8 " "	0.3 " "
Total protein	3.75 " "	3.84 " "
Fat, ether-soluble ..	0.27 " "	0.73 " "
Cholesterol	0.178 " "	0.38 " "

"The sample was not chyle, since chyle is lymph containing a large amount of fat. The milky appearance was due to protein loosely bound with lipid material, particularly lecithin."

Pathological description.—(S-33-131) by Dr. L. J. Rhea, Pathologist.

"Gross specimen consists of a segment of small bowel, fourteen inches in length, which has been clamped and cauterized at each end. This portion of the small intestine is somewhat flattened and arched over cysts in the mesentery. Lying in the mesentery of this segment of bowel are multiple cysts varying in size from one centimetre to a cyst with a capacity of 850 c.c. Two of the large cysts are communicating, but none communicate with the bowel. The two large communicating cysts are thin-walled, lie immediately adjacent to the bowel, and, when opened, contain a yellowish fluid loaded with cholesterol crystals. A third cyst with a thick fibrous wall, darker in colour, contains 700 c.c. of a dark brown fluid loaded with cholesterol crystals. The remaining mesentery contains many small cysts of all sizes, most of which have thin walls and none communicate with the bowel or with other cysts."

The following description is based upon a series of sections which were obtained after the gross specimen had been properly fixed. Large blocks of tissue were removed, imbedded in paraffin, and, when cut, were stained with differential stains.

"In Fig. 4, one can see with the unaided eye a complete transverse section of small intestine; the muscular wall is somewhat thinned, the villi are prominent and somewhat pale staining throughout their inner portion. The attached mesentery shows a collection of thin-walled cysts which vary in size and shape. Passing through its central portion is a band of connective tissue in which there are several widely dilated blood vessels. The band of compact red-staining tissue which borders part of the intestine and the group of cystic areas in

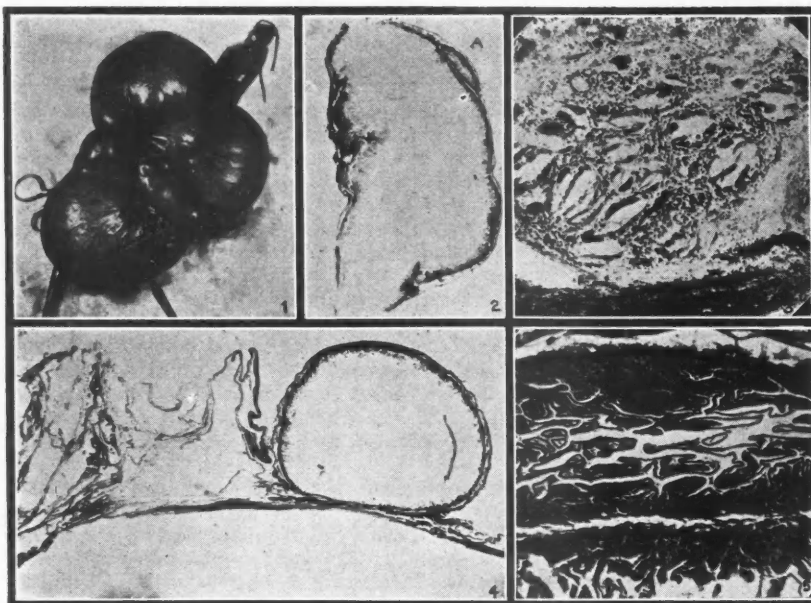


FIG. 1.—Photograph of gross specimen showing a loop of small intestine arching over multiple large cysts in the mesentery.

FIG. 2.—Transverse section of small intestine five centimetres above the site of the mesenteric cysts. At (A) an intramural intestinal diverticulum is seen.

FIG. 3.—An area of fibrosis showing the sites of cholesterol crystals and giant cells which border them.

FIG. 4.—Large section showing the small intestine cut transversely; the section also includes the attached mesentery, showing multiple cysts. The rather dense band at the right margin of the section is the wall of one of the very large cysts.

FIG. 5.—This is a high power view of the intramural cyst shown in Fig. 2.

the mesentery is a portion of the wall of one of the very large mesenteric cysts."

Microscopic examination.—"The mucous membrane of the intestine is intact. The villi are very prominent because they are wider than normal due to oedema. Some villi look cystic because their contents have largely disappeared in the process of preparation for sectioning. The inner glandular tissue in the mucous membrane shows congestion and dilatation of the capillaries. With the exception of the oedema, there is no microscopic lesion of the mucous membrane. The submucosa of the intestine is somewhat narrowed throughout its circumference.

"The mesentery contains numerous cysts, which vary in size and shape. The intercystic tissue is composed of the normal elements of the mesentery including lymph nodes, nerves and lymphatic vessels. In some places the lymph nodes project into the lumen of the cysts. The blood vessels and lymphatics of the mesentery are dilated but their walls are normal. One of the dilated lymphatics contains coagulated pink-staining material (lymph).

"The walls of the cysts vary a good deal in structure. Practically all of them contain smooth muscle, which is not arranged in a well demarcated inner and outer coat. In the walls of some of the cysts, two layers of smooth muscle can be seen. In others, irregularly arranged bands of smooth muscle can be made out when differential stains are used. The wall of the very large cyst is largely composed of dense connective tissue, but intermingled with it are smooth muscle cells in small bands. The cysts are lined with flattened cells which have the character of fixed tissue cells. None of the cysts show lining epithelium. The fact that there is smooth muscle in the wall of these cysts, even though it has not the arrangement of that in the intestine, is strong evidence of their enteric origin. One of the small cysts which is just beneath the peritoneum shows an internal and external muscular coat. It is probable that

the position of this cyst has made it possible for expansion to take place without leading to as much pressure as would have resulted in a larger or more deeply situated cyst. The epithelial lining of these cysts is absent, as is the rule in mesenteric cysts. The disappearance of the epithelium is the result of long-continued pressure within the cyst.

"There is very definite thickening of the smooth muscle of the small intestine at one place in the section where it lies adjacent to the largest cyst. Not only is the smooth musculature thickened, but it passes down a short distance in the folds of the mesentery. Within the substance of the mesentery between some of the small cysts, there are small areas which show the sites of cholesterol crystals, about which numerous foreign body giant cells are seen. In these areas there is quite dense connective tissue. These represent the sites of organized cysts (Fig. 3).

"Section 2 was obtained from the small intestine, five centimetres from the portion of intestine whose mesentery shows cystic change. The most striking finding in this section is the sharply outlined cystic area within the wall of the intestine which has the gross appearance of intestine and can be seen with the unaided eye.

"Microscopically, the mucous membrane of the intestine in this section shows a good deal of oedema of the villi with congestion of blood vessels. The muscular wall and submucosa are normal, except for a slit-like area in the submucosa of the small intestine, the long axis of which is in the circumference of the intestine. This area contains a lumen which is lined with mucous membrane similar in every way to that of the adjacent intestine, except that the villi are very long and flattened. There is a solitary lymph follicle in the mucosa (Fig. 5)."

CONCLUSION

The pathological findings suggest that the mesenteric cysts in this case are of enteric origin, remnants of intestinal diverticuli which were present during embryonic life. The smooth muscle in their walls is corroboration of this opinion. The absence of epithelial cells lining these cysts can be explained on the basis of the long-continued pressure. The presence of cholesterol crystals in sclerotic areas indicates the sites of old cysts. The finding of the intramural cyst with intestinal mucosa and musculature similar to that of the bowel and continuous with it is further proof that these are of enteric origin.

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IDIOPATHIC SPONTANEOUS PNEUMOTHORAX IN APPARENTLY HEALTHY ADULTS

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THE purpose of this paper is not to discuss the whole subject of spontaneous pneumothorax, but to briefly review the literature and to report a few cases of that rather rare condition of spontaneous pneumothorax occurring in apparently healthy individuals. Like other "rare" conditions, however, it is found, when looked for, more frequently than is supposed; and not infrequently cases of so-called "pleurisy" are found on examination with x-ray to be cases of spontaneous pneumothorax. It is a comparatively benign condition from which practically all recover. Its causation is still somewhat obscure, and because of this one may be excused for presenting a comparatively small series of cases.

Pneumothorax, or, rather, hydro-pneumothorax, was referred to by Hippocrates, and the well-known sign of Hippocratic succussion was described by the "Father of Medicine" in a few cases of evident pyo-pneumothorax. It was not until the beginning of the last century however that pneumothorax was described, except as a complication of gross disease of the lungs or traumatic injury. The literature is very fully reviewed by Emerson¹ in his exhaustive monograph, and it is from this article that the following review of the literature is abstracted.

We find Benj. Bell, in 1874, referring to cases of pneumothorax that might be produced by coughing, laughing or crying. Itard wrote extensively on pneumothorax in 1803, and Laennec describes very accurately the condition, with symptoms and diagnosis, but all the cases referred to by these early writers were of pneumothorax occurring in obviously diseased lungs—mostly pulmonary tuberculosis. In 1841 Saussir collected 147 cases, and one of these he describes as essential pneumothorax occurring without any apparent lesion in the lung. After this article individual cases of what was called essential or idiopathic pneumothorax were reported by various writers. In 1887 Hall² collected 31 cases of pneumothorax occurring in the apparently healthy. In the same year West³

describes cases of pneumothorax occurring in patients considered healthy, developing during sleep, while sitting still, or while walking quietly, or after some slight exertion. In 1888 Gabb⁴ reported a case of a woman who had four attacks of pneumothorax at intervals of one, two and five years with no other apparent disease of the lungs. Others have reported cases with recurrences. West reported a case with three attacks. Woodward reported a case with the first attack on one side and a recurrence on the other. In 1902 Frissell and Reisman⁵ reported 2 cases and collected 56 others of non-tuberculous spontaneous pneumothorax. It was a benign form; all but one recovered, and it occurred mostly in young men. There was no formation of fluid and very little febrile reaction.

Because of its rarity, and also its benign course, the etiology of this condition has largely been speculative. Zahn⁶ reported 6 cases with autopsy and classifies the causes as follows: (1) pneumothorax with rupture of emphysematous vesicle—2 cases; (2) pneumothorax due to the rupture of an interstitial pleural emphysematous bleb—2 cases; (3) pneumothorax due to tearing of pleura besides old adhesions—1 case; (4) pneumothorax from atrophy of the visceral pleura—1 case.

Emerson in his article reports 2 cases occurring without injury and in discussing etiology mentions that Osler places one of them as due to rupture of an emphysematous bleb. Secretion of gas in the pleural cavity was suggested by Riellier and accepted by Laennec as a possible cause of idiopathic pneumothorax, but Zahn's cases are apparently the first in which autopsy was actually done.

Coming to more modern times, various writers from time to time have reported two or three cases. The only one with an autopsy report is that of Meyer.⁷ This patient had three attacks of spontaneous pneumothorax within a year and the post-mortem revealed extreme emphysema of both lungs and no tuberculosis. There is no case reported in the available litera-

ture of an autopsy on a spontaneous pneumothorax in a person who previous to the attack was apparently healthy.

Lewald⁸ in 1926 reported 10 cases, one bilateral, and concluded that:— (1) pneumothorax may occur in a person with healthy lungs and result in complete and permanent recovery; (2) in some cases air may pass from one pleural cavity to another, producing bilateral pneumothorax; (3) bilateral pneumothorax may result in complete recovery; (4) unilateral pneumothorax may persist for years. In the discussion on this paper J. A. Miller, Willy Meyer, Gerald Webb, and Lemon expressed the opinion that these cases of idiopathic pneumothorax should all be regarded as of tuberculous origin and be so treated. Palmer and Taft⁹ reported 5 cases, and state that only 70 cases have been reported and no more than four cases by one man. In two of their cases a hæmorrhagic effusion developed, a rather unusual complication. Fisher¹⁰ and others have also reported a few cases.

Onset.—The onset is generally with sudden and severe pain in the side affected. The attack generally develops after some very slight exertion, such as slight cough, laughing, etc. It not infrequently occurs without any particular exertion and may develop during sleep. Accompanying the pain there is definite dyspnoea, sometimes quite severe, generally some cyanosis and a certain amount of shock, rapid pulse, sweating, etc. As a rule the patient rapidly develops tolerance to the condition and beyond some dyspnoea has no other symptoms.

Diagnosis.—In the more marked cases with complete collapse of the lung the diagnosis is made by the four signs—*viz.*, immobile chest on the side of lesion, hyper-resonance, absent breath sounds, and displacement of the heart to the side opposite the lesion. In cases where there is only partial collapse the diagnosis is often missed until an x-ray of the chest reveals a partial pneumothorax. These cases are frequently diagnosed as pleurisy until an x-ray reveals the condition.

Course.—Some cases develop a small amount of effusion, but this very rarely if ever becomes purulent. There may be a slight febrile reaction for a few days, and until the lung re-expands there is some rapidity of the pulse due to displacement of the heart. The lung rapidly re-expands, sometimes within less than a month, generally within three or four months at the

most. Some cases have been reported in which the lung was still collapsed after a period of twelve months or even for several years.

Prognosis is almost uniformly good. Where death has occurred there has been extreme emphysema due to asthma or some allied condition. These are not in the class of cases reported here, as all of these had no obvious previous disease of the lungs. Very few cases are reported as having developed tuberculosis after the attack. Those showing manifest tuberculosis afterwards have generally had manifest tuberculosis at the time of the attack.

Treatment.—At the time of the attack rest in bed and morphine to relieve pain is generally all that is required. Where the dyspnoea and cyanosis is severe it may be necessary to withdraw a certain amount of air. This was not required in any of the cases described below. As a rule no treatment is required to re-expand the lungs. Should the pneumothorax persist without any signs of re-expansion it may be necessary to try aspiration of air.

There is then a benign type of spontaneous pneumothorax occurring in young adults, more frequently in males than females. The attack comes on suddenly in a person apparently previously healthy. After the initial shock and slight febrile reaction the lung gradually expands and no apparent harm is done.

Etiology.—This is somewhat obscure. A certain number of cases are reported in which there has obviously been an emphysematous condition preceding the attack and the pneumothorax has been due to rupture of an emphysematous bleb. These are not included in the type of case discussed here. It seems probable that in some apparently healthy persons a small pleuritic adhesion is torn by some slight unusual exertion and the lung ruptured. This explanation is not altogether satisfactory, as some cases showed complete collapse of the lung with no sign of adhesion. In these cases the pneumothorax is probably caused by the rupture of an isolated emphysematous bleb. A number of the cases, though, show only a partial pneumothorax, the lung being prevented from collapsing by other adhesions. The primary cause of the adhesive pleurisy may, among other things, be due to tuberculosis, and to that extent this type of attack is due to tuberculosis. The following seven cases are reported.

CASE 1

J.A.S., male, aged 42, was first seen on March 6, 1925. Three weeks previously he had had a sudden pain in the right side while eating his evening meal and became quite dyspnoic. He came for examination because of dyspnoea and pain in the side.

Examination showed complete pneumothorax on the right side. The heart was displaced to the left. In June there was only slight re-expansion, and a small quantity of fluid in the pleural cavity. In August, 5 months after the pneumothorax, the lung had completely re-expanded, and there were no signs of fluid. Examined one year later, he had been working steadily; he was a little short of breath on exertion. The lung had completely re-expanded. There was no sign of tuberculosis or other disease.

CASE 2

G.B., male, aged 22, was first seen on March 2, 1931. The onset was 10 days previously with pain in side, fever, and some cough.

Family and personal history were negative.

Examination showed a hyper-resonant left base with diminished breath sounds. The x-ray showed a small pneumothorax at the left base. The lung was about one-third collapsed. The patient was kept at rest for about two months. When examined at the end of two months the lung had completely re-expanded. No sign of tuberculosis. He has remained well since.

CASE 3

Mrs. A., female, aged 30; Japanese. She had had a hysterectomy for cancer of the cervix on July 12, 1931. On the day following the operation she developed acute dyspnoea and pain in right side and could only obtain relief by lying on right side. Her pulse was 140 to 150.

Physical examination showed the whole right side to be hyper-resonant. The breath sounds were very distant, but with definite amphoric quality. The heart was displaced to the left. The diagnosis was spontaneous pneumothorax. This was confirmed afterwards by x-ray, which showed almost complete collapse of the right lung. The patient rapidly improved; dyspnoea disappeared in a few days. She left hospital 4 weeks after operation and 3 weeks afterwards the fluoroscope showed the lung to be completely expanded. She has remained well since; no sign of tuberculosis.

CASE 4

H.W.G., male, aged 38, a returned soldier. The history was that in 1916 he had had a shrapnel wound of the left side followed by pleurisy and some effusion. He had been quite well since the war and had been working steadily. On July 5, 1931, while swimming, he took a back dive and immediately felt acute pain in the right side followed by shortness of breath. There was no rise of temperature or pulse, but he had a slight rasping cough. An x-ray of the chest showed definite localized pneumothorax of the lower lobe of the right lung. The x-ray also showed some old shrapnel in the lower lobe of the left lung and slight adhesive pleurisy. Fluoroscopic examination, two weeks after, showed small pneumothorax and a small amount of fluid. One week later the fluid had disappeared and the lung had almost re-expanded. Four weeks after the accident he was back at work. The x-ray showed the lung to be well expanded and no sign of pneumothorax. The patient remained well and was working ever since. No sign of tuberculosis.

CASE 5

B.G., female, aged 22. Her brother had had enlarged glands in neck, and her sister had had glands removed. Twelve years ago she was said to have had dry pleurisy on the right side, but had been in good health since.

On July 24, 1931, while swimming, she took a sudden acute pain in the right side, and was very dyspnoic for 4 or 5 days, but with no temperature. X-ray showed pneumothorax of right side, with the lung about two-thirds collapsed. She was kept in bed for two months, and gained in weight. X-ray, September 11, 1931, showed the lung to be fully re-expanded and there was no sign of lung disease. The patient was kept under observation and on modified rest treatment.

March, 1932, eight months after the first pneumothorax, the patient developed a sharp pain in the left side with shortness of breath. There was no rise of temperature. On examination the pulse was 80, temperature 96°; the breath sounds were diminished over the left side with hyper-resonance. X-ray showed pneumothorax of the left lung with collapse of the upper two-third of that lung. Within a month fluoroscopic and physical examination showed the left lung to be well re-expanded and no sign of lung disease. She was on modified rest treatment all summer.

She reported in September, 1932, weight 118½ pounds (a loss of 4 pounds in three months). An x-ray plate now showed in the mid-mediastinum on both sides definite shadows extending into the parenchyma of the lung, more marked on the right side than on the left. The shadows were well marked, somewhat rounded, and the size of a plum. A diagnosis of mediastinal tuberculosis was made, and the patient put on absolute bed-rest. During the winter of 1932-33 she improved rapidly, gaining seven pounds in weight, and the mediastinal shadows gradually receded.

Re-examined in October, 1933. Her general health was excellent. X-ray of chest showed some slight striated mottling in mid-mediastinum—otherwise no disease.

This is a case of recurrent spontaneous pneumothorax occurring first in the right thorax and then in the left, afterwards developing definite symptoms of mediastinal tuberculosis. In this patient there is a family history suspicious of tuberculosis, and a history of right-sided pleurisy some years before the attack of pneumothorax.

CASE 6

P.W., male, aged 30. There was no family history of tuberculosis and no history of previous serious illness. He was at work scrubbing floors when he felt a sudden pain in the back and right side; a little short of breath. He had some pain in the side for two days and because of this reported to Dr. Eggert on September 1, 1933.

X-ray showed a small spontaneous pneumothorax on the right side. Except for shortness of breath the patient suffered no inconvenience. The lung re-expanded rapidly. An x-ray, taken one month after the attack, showed no sign of pneumothorax and no lung disease. The general health of the patient was excellent.

CASE 7

Mrs. J.W., aged 24 (reported through courtesy of Dr. Trites and Dr. Strong), was admitted to Vancouver General Hospital in May, 1933, because of uterine hæmorrhage and a mass in the pelvis. Laparotomy was performed for removal of a cystic ovary, and curettage. Her previous history was negative as to any lung disease or tuberculosis.

Immediately following laparotomy under intra-tracheal anaesthesia, she complained of some pain over the heart, and her pulse rate went up over 100. Next day she was definitely dyspnoic and slightly cyanosed, and the heart was found to be displaced to the right, and the physical signs of pneumothorax on the left side. This diagnosis was confirmed by x-ray, which showed the left lung to be well collapsed. She had considerable distress (pain, dyspnoea) for three days. The temperature rose to 101° on the first day, but returned to normal in three days. The pulse went as high as 124 for about the same period. The symptoms gradually subsided and

the patient was discharged after fifteen days in hospital. The lung was almost completely re-expanded on discharge. There were signs of a small pleural effusion for a few days. At present she is apparently well; no signs of pulmonary tuberculosis.

SUMMARY

Seven cases of spontaneous pneumothorax are reported, occurring in apparently healthy adults, all of whom recovered, and, with the exception of one case, showed no apparent lung disease after complete re-expansion of the lung.

Four were males and 3 females, a larger proportion of females than usually.

Five occurred between the ages of 20 and 30; two between the ages of 30 and 40.

Only one patient had a history suggestive of previous tuberculous pleurisy, and this one, after two attacks of pneumothorax, developed definite clinical symptoms of tuberculosis. This is one case out of five that have been under more or less observation for two years or over. Two have been under observation less than six months, and it is too early to be certain that no tuberculosis will develop.

Four showed almost complete collapse of the affected lung; in the other three there was only a partial collapse of the lower lobes.

Complete re-expansion of the lung occurred in all without any special treatment. In five the re-expansion was complete within one month; in one, within 10 days. One took two months, and one which had the most complete collapse of any took five months. A small amount of pleuritic fluid was demonstrated in three cases a few days after the attack. A slight rise of temperature followed in practically all cases.

The symptoms of pain, dyspnea and some collapse varied with the degree of pneumothorax.

In the cases of complete collapse the diagnosis by physical examination was fairly easy, but where the pneumothorax was small and localized the condition was generally diagnosed as acute pleurisy until an x-ray of the chest showed the true condition.

The two cases reported following anaesthesia for laparotomy raise the question if this accident does not occur more frequently following operations than has been recognized. These cases were complete and easily recognized, but the small partial pneumothoraces could be easily overlooked unless an x-ray of the chest were taken shortly after the accident occurred. In the literature available there is no report of similar cases occurring after operation.

Symptomatic treatment at the time of the accident, to relieve pain and distress, followed by rest in bed until the lung has re-expanded or nearly re-expanded is apparently all that is indicated.

CONCLUSIONS

Spontaneous pneumothorax is an accident that may occur in apparently healthy persons.

It is probably caused by some slight exertion sufficient to tear an old pleuritic adhesion, which makes a small rupture in the lung tissue. Probably pleuritic adhesions, especially the slighter ones, are ruptured quite often by violent respiratory efforts, but only rarely do they tear through to the parietal pleura and rupture the lung.

Spontaneous pneumothorax may occur as an accidental complication after anaesthesia.

In the absence of other definite evidence of tuberculosis the type of case referred to here should not be considered as tuberculous, but should be considered as a tuberculous "suspect" and re-examined at intervals for at least a year.

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"ANACIDITY"; A PROTEST.—Dr. F. J. Allen writes: The word "anacidity" should not be allowed to pass into general use without at least a protest from some of our profession, even though the protest be ineffective (or aneffective, as some may prefer to say). The proper word is, of course, "inacidity." Scientific authors of linguistic howlers are not slow to ridicule parallel cases where the unscientific writer flounders in the use of scientific terms. There is no need for the commission

of such barbarisms as "anacidity." Everyone who wants to launch a new term should consult a specialist in etymology. If this had been done in the past the medical profession would have been saved from the stigma of inventing such terms as "anoci-association" (for innocu-association), "chemo-taxis" (for chemio-taxis), and "ptomaine" (for ptomatine or ptomine).—*Brit. M. J.*, 1933, 2: 404.

[To which we might add "appendectomy", "bacteræmia," and "urinalysis." ED.]

ANGINA PECTORIS: A CLINICAL CLASSIFICATION*

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THE term "angina pectoris" means spasmodic painful suffocating attacks in the breast or chest. The afflicted consult us for what they believe is a pain in the heart, qualified as the case may be, and we invariably suspect it. Literally, the term "angina pectoris" implies the same. Consequently, one might be justified in accepting the patient's meaning and interpret this in our nomenclature. It is heretical only because we have accepted the terminology as an entity for a characteristic syndrome. Historically, Heberden (1768) was the first to attach the very great significance to one of the worst of these types of pain. Enlightening as this was, the morbidity with which Heberden's angina is attendant has had the effect of creating much confusion. This is so mainly in the reserve with which one is wont to make an interpretation of pain of this kind.

It is proposed to accept the patient's interpretation of "heart attacks", "heart pangs", and regard them as paroxysms of suffocating breast or chest pains, and to use the term "angina pectoris" as synonymous with "pectoralgia" and sternalgia.

CLASSIFICATION

Generally, it is impossible to carry a long list of conditions that contribute to the disorder of an anatomical part, for classification is made more difficult by specialization in a field of intensive study and by unavoidable enthusiasm in that field. Where possible, it is advantageous to bring to the clinical bedside a comprehensive, though concise, conception in the form of a brief classification. This must be as nearly compatible with physiology and pathology as our knowledge of the subject will permit.

From this standpoint angina pectoris can be systematized under four clinical groups as follows: (1) maligna; (2) vera; (3) simplex, and (4) similans. I desire to point out at once that this is not another means of restating the older terminology of false, atypical or pseudo-

angina in disguise. On the contrary, it is hoped to escape this. For this reason the division will be immediately qualified by designating the whole problem to two productive mechanisms. That is to say, the symptomatology is either by way of the cardiac pathway, or it is not and is entirely extra-cardiac. The first three types, noted above, have their origin in interference with the neuro-cardiac network; the last is entirely extra-cardiac. The inference is that there is no compromise; stating the type gives consent to the mechanism. To prevent repetition we will depend on what is to follow to justify these premises.

At this juncture it should be noted that the resultant clinical phenomena corresponding to the above groups are due mainly to interference of blood supply to the heart, but not entirely. Also, not all cardiac pains are the result of coronary disease, or even actual disease of any kind that can be demonstrated as pathological changes. A simple illustration is the case of a sudden shock, exhibited by a gasp, a clutch at the left pectoral region, pallor, and even an altered cardiac rhythm, all of which is not unlike Heberden's angina, except as to degree, occurring as a passing incident in normal hearts.

THE PHYSIOLOGICAL PROCESS

The *modus operandi* of the altered functions which produce the subjective sensation of pain and the corresponding objective signs of pallor, anxiety, altered blood pressure and pulse, in the particular case, is not final. The mechanism for all the groups enumerated is again of two forms, the neuro-cardiac and the extra-cardiac pathways. Tabulated simply, the theoretical concepts advanced are comprehensible in the following outline of the origin of pain and sequelæ.

Pain production.—There is no choice in the pre-eminence of the above postulates in relation to the cardiac origin of the accrued disorder. There are very definite instances where the three stated factors are separately responsible agents of primary dysfunction. The general arterio-sclerotic group will give the greater incidence of

* A lecture given before the Prince Albert Medical Society on June 8, 1933.

coronary disease; the dilated aortic arch is a proven primary source of pain, and the enlarged heart is a more likely contender for the fatigue group. The summation of our knowledge is perhaps best contained in the more recent studies of Resnik, and further supported by Lewis,¹¹ as instanced in the latter's simple experiments on muscle fatigue. Anoxæmia of the heart explains all the characteristics of angina, even sudden death. The pain is determined by some clinical or physico-chemical agency within the muscle, and the pain continues unchanged until the circulation is restored. Accepting, *pro tem.*, Lewis' postulates, it will not be impossible to

TABLE I.

NEURO-CARDIAC.	1. Coronary	{ Constriction (Jenner; Parry, 1799) Distension (Spiegel; Wassermann, 1926)
	2. Aorta...	{ (Allbutt, 1915; Wenckebach, 1928) Fatigue (Mackenzie, 1923)
	3. Heart muscle	{ Anoxæmia (Resnik, 1928; Lewis, 1932)
EXTRA-CARDIAC.	{ 1. Local. 2. Referred.	

concede the view taken here, which is to follow, in respect to the clinical causes of angina. Before leaving the matter of pain production, mention should be made of the opposing states of constriction versus distension. Constriction with ischæmia is self-evident. Distension of an artery, including the aorta, also produces pain, as shown by Odermatt, Spiegel and Wassermann. It is not a question of how vascular distension instead of spasm explains better the clinical manifestations of pain, as pointed out by Lambert,¹⁰ but rather that both are conceivable explanations.

Pain conduction.—The nerve pathways are being clarified. Surgical studies on the sympathetic nervous system have added impetus to further the anatomical details. The pain impulse is confined mainly to the extrinsic nerve supply, consisting of sympathetic and parasympathetic (vagus) systems, and the intermediary depressor nerve. The sympathetic pathway, to state the opinion of the majority, is the main, if not the only, afferent impulse carrier of painful sensation to the brain from the heart and aorta. The impulse arises in the sensory nerve endings embedded in the adventitia of the coronaries and aorta. Spreading over the sympathetic plexus, it radiates centripetally along afferent fibres that reach the sym-

pathetic chain from the superior cervical down to the fourth dorsal ganglion. Removal of both stellate ganglia makes insensitive the aorta and the greater portion of the heart but does not effect a complete cure because of the remaining portion of the dorsal chain. This knowledge has special importance in relation to surgical therapy, and, to quote Cannon, "Any high degree of excitation in the central nervous system, anger, terror, pain, anxiety, fear, grief, disgust, may rouse the sympathetic system to activity and affect the function of all organs which it supplies." This part of the autonomic system has long been known as cardiac accelerator in action. That in the heart it is vasodilator and thereby compensatory to the general systemic circulation is a more recent conception (Anrep and Segall^{1,2}). The arteries of the heart will be dilated by the same agent that increases the rate of the heart or increases the systemic blood pressure.

The parasympathetic (vagus) pathway does not carry sensory impulses that reach consciousness; vagus impulses become dissipated before reaching the sensorium and only create vasomotor reflexes. That this part of the system is inhibitory, causing slowing of the heart, is well known. It is vasoconstrictor to the coronary arteries.

It is denied that the depressor nerve is a vagus structure. It was regarded as such on physiological grounds. There are indications that it may be regarded anatomically as of the sympathetic system. It is conceded, however, to be the means of conveying impulses caused by increased aortic and intracardiac changes in pressure to the vasomotor centre and of effecting a generalized lowering in the blood pressure.

CLINICAL CONSIDERATIONS

The causes productive of the particular types of clinically distinguished anginal disease are illustrated in the outline that follows. It is to be explained, as per example, that whereas a severe anæmia can produce a simple form of angina a coronary thrombosis of another origin may exist at the same time, so that a diagnosis is not made without thorough investigation. In the absence of further findings the anginal syndrome is attributable on legitimate basis to the first-mentioned.

As will be noticed, we are constantly stressing, and at the same time trying to simplify, the

clinical perspective of the whole problem. To further the purpose it will be in order to cite a condensed clinical concept which it is believed has advantages that exceed its shortcomings.

Angina pectoris maligna.—This type represents the group of grossest coronary insults. Only two other relatively rare pathological con-

ischæmia as is that of the left coronary artery. The latter is the larger of the two and divides into two branches; the major passes along the interventricular sulcus and the minor passes around the atrioventricular groove. The left supplies the left auricle, two-thirds of the interventricular septum, most of the left ventricle, and a small portion of the right ventricle. Terminal branches turn acutely into the myocardium, predisposing it to the dangers that follow on arteriosclerosis with tortuosity and embolic tendencies.

In summing up the abbreviated anatomical review just given, it is of value to point out that coronary arteries are no longer considered endarteries. Free anastomosis occurs between the arteries, and, in given cases, with the chambers of the heart by way of the coronary capillaries and thebesian veins. The blood supply is proportionally equal in both sides of the heart in early life, and with age there is a shift from the right. The left ventricle is the ventricle of infarction. It is preparatory to this that the left heart becomes re-enforced by increased vascularity and increased anastomosis of the arteries, beginning prior to middle life. Coronary artery occlusion after seventy years of age shows the lowest mortality. The blood-supply of the first portion of the aorta is from both coronaries only, which form the vasa vasorum of this part of the aorta.

The rate of obliteration of the coronary vessels plays an important part in the extent to which anastomotic channels develop. Other factors are equally essential. Not all hearts possess the same degree of free anastomosis. Age-groups indicate a decreased mortality in the late decades of life. What concerns us in angina maligna, however, is that the onset is acute, and the occlusion is complete. Of prime importance is that the resultant phenomena are invariably catastrophic. The mitigating circumstances, one may infer from this, are that the field may have been prepared for the final blow by the age of the individual, the rate of occlusion, the degree of existing anastomosis, either natural or the result of a slowly narrowing vessel, and that the area involved may be variable. Clinically, it is the angina of recumbency. It occurs most frequently while at rest. It is characterized by prostration, and restlessness is symbolic of its type. The onset is sudden and sometimes immediately fatal. The first concern is pain, and

TABLE II.

1. ANGINA MALIGNA	<div>Coronary thrombosis Coronary embolism Coronary obstruction Buerger's disease</div>	<div>Mechanical pressure; mediastinal, aneur- ismal source.</div>
2. ANGINA VERA	<div>Coronary sclerosis Coronary reflex spasm Myocardial insufficiency Aortic disease.....</div>	<div>Rheumatic heart in the young. Enlarged heart of middle age. Degenerative. Sclerotic.</div>
3. ANGINA SIMPLEX	<div>Toxic—Sepsis; acute infections; tobacco. Anæmia—Primary and Secondary. Arrhythmias { Paroxysmal tachycardias; and Extra-systoles. Digestive—Cholelithiasis; cardiospasm, etc. Asthenias { Neurocirculatory; neurasthenia, Carbohydrate deficiency.</div>	
4. ANGINA SIMILANS	<div>Myalgias { Local trauma; tactile; masto- dynia; with menses. Neuritis... Intercostal; herpes zoster. Arthritis { Dorsal spondylitis; scoliosis and kyphosis, etc. Pulmonary { Diaphragmatic pleurisy; spontaneous pneumothorax, pleuro-pericarditis. Nervous... Mimicry; obsessional psychosis.</div>	

ditions sometimes occur that are comparably dramatic and malignant; these are, ruptured cardiac infarct with hæmopericardium, and ruptured aorta, with or without aneurysm.

Both coronary arteries are liable to the same diseases. The right coronary artery is the

TABLE III

Clinical Type	Essential Qualities	Clinical Symbol
A. Maligna	Angina of recumbency	Restlessness
A. Vera	Angina of effort	Standstill
A. Simplex	Angina of oppression	Asthenia
A. Similans	Angina of hyperæsthesia	Inframammary pain.

smaller of the two. It supplies the right auricle, right ventricle, and, what must be remembered, it supplies the basal part of the left ventricle. Acute infarction of the right ventricle is very rare. That is because the small branches of the right coronary do not spread out at an acute angle and anastomosis is free. In other words, occlusion of the right coronary is not marked by the same degree of acute and complete

the second in order is shock. Subsequent signs include leucocytosis, temperature, pericardial rub, altered rhythm and blood pressure, electrocardiographic changes, and a reaction to tobacco in persons who are habitual smokers. The pain is almost beyond endurance and obstinate. At some time, usually very early, the pain is confined to the lower substernal area. The ominous impression we have of this in cases in our own experience has led us to formulate the dictum—treat before you diagnose—in suspected cases. Shock is alarming and aggravated by a disturbing restlessness. The anxious expression and the pallor mixed with a livid hue last while death hovers over. In these alone we can find good indication of how imminent the danger is and when one can dispel the fears thereof.

One-half of this group survive acute occlusion. The increasing frequency of its occurrence should be a warning to the unwary that its existence should be considered with the same respect as the elusive gangrenous appendix is in another region of the body. The immediate danger lasts for three days at least. The patient must rest in bed for at least six weeks. Exercise should be graduated afterwards. A good proportion resume work after one to two years. The survivors, during this period, find themselves restricted by force of an effort angina, and we find them frequently in the next group to be discussed.

Angina pectoris vera.—Very little need be added to the original description of Heberden as to the clinical characteristics. This is the angina that is familiar to all. A complacency existed in relation to the subject as a clinical entity until 1912 and when the rôle played by diseases of the coronary arteries in contributing identical symptoms was demonstrated. Since then valuable scientific data have appeared which, with all due respect, have not established a *sine qua non* as to cause and effect.

In this presentation we want to emphasize that in this group the onset is preceded by a very definite effort, either of exertion or emotion. The attack is precipitated suddenly; it is prefixed by an effort; occasionally there are foreboding signs; it is manifested in the form of intense agonizing pectoral and psychic disturbances, and the patient's reaction is pathognomonic in the standstill or rest that is enforced.

The pain is not specific or constant in distribution. The psychogenetic concomitant of

angor animi, too, is variable. Variable as all these may be, together they form indispensable components of the symptom-complex.

To the patient the discomfort is pain, though it may be a constriction, tightness, griping or cramp-like sensation in the chest. Retrograde sensations towards the heart, commencing in the neck, shoulder, hands, and occasionally the tongue, lower jaw, ear or throat, may usher in an attack. During an attack and afterwards radiating pains are noted towards both shoulders, hands, fingers, infrascapular region, and the left arm (quoted by White¹⁴ as 25 to 50 times more often than in the right). An attack that lasts longer than an hour is not likely angina vera.

The condition usually occurs at fifty years of age; it is rare in young people, except with rheumatic heart disease. Paul D. White¹³ states that 95 per cent show some coronary disease. A small percentage remains where no lesion is found. The difficulty with this group is the diagnosis. There are no set rules. In our experience a detailed history, plus or minus cardiovascular disease, is the first principle in interpreting the disorder. We respect all three probable causes, coronary, aortic or myocardial disease. In the small group with no lesion, that are probably reflex spasm, and in the group of primary coronary sclerosis where there is not always an associated peripheral vascular disease to assist in the interpretation, the therapeutic response to nitroglycerin is employed as a diagnostic aid. The history is perhaps more dependable than any other singular finding. Two illustrative cases are to the point.

A middle-aged woman, employed as secretary to the Medical Officer of the Department of Pensions for Returned Soldiers, consulted us in a state of early congestive failure. She gave a typical dramatized history of acute anginal seizures. We discounted this latter on the supposition that in a decompensated heart angina is rare, and on our presumption of her acquired knowledge about relative matters in the course of her occupation. The omen was disregarded. Though she responded to restorative measures, which further gave us confidence in a favourable prognosis, she died suddenly and autopsy showed advanced coronary disease.

Another case, a man of 40 years of age, gave a typical narrative description, indisputably of angina. Exhaustive examination showed no cardiovascular disease. The history failed in its entirety until we elicited the fact that an uncle, with whom he had lived, died only the month previous of a similar condition. Needless to say our patient is still very much alive.

Angina pectoris simplex.—The list of causes given in the Table previously is formidable. Even if disputable, it is a very excellent working

basis. In support of the reason for classifying this heterogeneous group as simple anginas we refer to Lewis and others who have studied the effects of anoxæmia, to Cannon on what might be termed sympathetic explosion, and to Pearcey and Howard (1927) demonstrating that under certain conditions distension of a portion of the intestine reacts reflexly on the heart through its sympathetic innervation.

To repeat, the pain mechanism is via the neuro-cardiac apparatus. There is nothing "false" or "pseudo". The only approach to anything atypical is that the pain is not characteristically dramatic in its exhibition, and this is conceded because more frequently there is a sense of oppression or weight, and of soreness, rather than pain. The patient is aware constantly of a dull ache in the præcordium. Exacerbation amounting to an "attack" is not preceded by sudden exertion, but is the result of continued exertion, which is followed by fatigue and exhaustion. It is not a severe post-effort syndrome, but rather the product of an exhaustive process. The climax is not precipitated; it is cumulative. There is no extreme distress or anxiety in the majority of cases, though pallor, palpitation and giddiness are present.

Diagnosis is more difficult than in the other types. A suitable causative factor or focus which is the responsible agent must be ascertained. The examination therefore, requires to be more general. Judgment is severely taxed.

The point of view will be strengthened by brief reference to illustrative instances. Full case reports are impossible here.

In the matter of toxic factors, removal of dental sepsis restored a farmer to his former arduous labours. Our earliest experience in the case of a young girl of 19 was baffling at the time of her attack or exacerbation of præcordial distress, and continued to puzzle us even after a thorough cardiovascular study. Her cosmetic skill and our deference received a deserved jolt when we discovered that her spleen, though of normal size, showed up rather noticeably on some routine x-ray films taken in the course of investigation. Blood examination showed a marked hypochromic anæmia, with hæmoglobin 28 per cent. In the same order, a man past middle life came with a diagnosis of angina pectoris which for two years restricted his existence to almost complete inactivity. Iron deficiency restored, recovery followed.

Arrhythmias are undeniable causes of cardiac distress. The simplest and most frequent are extra-systoles, with or without heart disease. Paroxysmal spasms of this nature, properly

evaluated, will lend themselves to correction, or benefit will come from reassurance. Of the digestive disorders it may be said that the main difficulty is the retroactive possibility where one cannot tell apart the cause from the effect.

A middle-aged female was found (1929) pulseless, collapsed and cyanosed. First aid consisted of artificial respiration and intravenous adrenalin. A tentative diagnosis of coronary accident was made on the basis of distant heart sounds, a previous diagnosis of left brachial neuritis, considered in the light of the present accident as probably a residual pain centre of cardiac origin, and because of continued præcordial oppression for six weeks under observation in the hospital. Finally, a cholecystic operation cleared up innumerable calculi and all her symptoms, without recurrence to this day.

A case, now in the hospital, of acute spasmodic substernal pain, which focussed the attention of previous observers on the heart, shows an extensive malignancy of the cardiac end of the stomach.

Without elaborating, we should like to place ourselves on record as believing that the neuro-circulatory asthenias and the neurasthenias that show left pectoral oppressions and spasmodic suffocative attacks are rightfully as much simple anginas as any we have mentioned.

To sum up this phase, it should be said that there is always a cause; that where the cause is remediable the recovery incidence for this group would be 100 per cent. Reassurance against an obsessional state is paramount. Apropos and proverbially, it is a grosser injustice to diagnose a simple angina as angina vera than *vice versa*.

Angina pectoris similans.—It may be enunciated that in this group the course of pain is along the spinal nerve routes, as distinguished from the other groups whose pathway is the sympathetic system involving the cardiac network. The cardiac structures are not implicated except at the point of "overflow", as postulated by Head; when that is the case it may be reasoned that the cardiac response to be expected will more likely be motor than sensory. The symptom complex of this type is notorious for the degree of hyperæsthesia or superficial tenderness. Clinically, they form the largest group of pains pointing to the left inframammary region.

The greater number of patients in this group complain of a continuous pain which is always worse after a day's work. Sometimes the pain is worse on deep inspiration. Frequently changes in the weather influence the pain. Rest improves the symptoms, and some get relief from movement, especially those who suffer most at night and do not rest well in bed. The dyspnœa

on effort, which is usually moderate, is explained on the basis of a lowered condition of health. One very acute attack of pain observed by us at the time of the onset caused us great concern until the aftermath, when we recognized a spontaneous pneumothorax.

Noteworthy points in diagnosis are the absence of cardiovascular signs, hyperæsthesia, local tenderness, and the particularly common localization in the inframmary region, corresponding to fifth and sixth dorsal spinal segments. Chiefly, the site and type of pain form the first approach to its identity.

SUMMARY

"Angina pectoris" is accepted as meaning a disease characterized by spasmodic, suffocative attacks in the breast or chest.

The disease is clinically distinguishable as (1) A. maligna. (2) A. vera. (3) A. simplex.

(4) A. similans. The list of causes cited (as in the second Table) are deductions from cases met with in our own experience and may be added to.

In support of this classification, the mechanism of cause and effect is based on accredited work of authors duly referred to.

A practical approach to the recognition of the individual types is tabled and some details in relation to each are discussed.

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A PLEA FOR THE EARLIER DIAGNOSIS OF PERNICIOUS ANÆMIA, WITH QUOTATION OF CASES*

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SINCE the original report of Minot and Murphy¹ in 1926 on the dietary treatment of pernicious anæmia, interest in the disease has been stimulated and the literature enriched by reports from workers in many centres. Exhaustive work has been done and much accomplished in finding substitutes for whole mammalian liver, originally recommended as a therapeutic agent. This has all been valuable, but it would appear that more emphasis might now be placed on the early and unusual clinical signs of the disease. This paper is undertaken to assist the general practitioner, and through him the patient, whose interest is always foremost in the professional mind.

It has been said that when diabetic coma occurs someone is to blame. It might also be said that when a pernicious anæmia develops to the stage of the classical textbook picture, someone is to blame. However, some cases do appear to develop to a marked degree in a few

weeks. The family physician sees the patient in the early stages of the disease, and on him must rest the responsibility for earlier diagnosis.

As in other diseases, a careful history is essential, if one hopes to diagnose pernicious anæmia early. There is not sufficient time or thought given to the taking of histories by the majority of us, and the only way I know of taking satisfactory histories is to develop a definite routine. First allow the patient to give his story in detail, for this may give one important clues. Then inquiries should be based on possible disorders of one system after another. Make it a habit when inquiring as to appetite, indigestion, and bowel habit, to ask about sore tongue and sore mouth. Patients often forget to mention these symptoms, because they are not present at the moment. Then inquiry as to abnormal sensations such as numbness, paræsthesia, etc., should be made in taking every history. To make a diagnosis of pernicious anæmia at the onset of the disease,

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one must be constantly looking for the early cases. Whenever such symptoms and signs as weakness, excessive fatigue, anorexia, sore tongue, indefinite gastro-intestinal disturbances not related to meals or time of day, palpitation, dyspnoea, paræsthesia, anæsthesia, hyperæsthesia, impaired sense of vibration, impaired muscle and bone sense (including position), impaired touch, pain and temperature sense, ataxia, altered tendon reflexes, altered cutaneous reflexes, impairment of sphincter control, crises, irritability, slow thought or speech, disorientation and flight of ideas, are brought out in the history and examination, pernicious anæmia must appear in the differential diagnosis. Any of these symptoms or signs may on occasion be present and even be very severe in pernicious anæmia before a blood study will confirm the diagnosis. The following case illustrates this well.

CASE 1

Mrs. J. N., aged 64, was sent in April, 1931, by her physician to a surgeon for cystoscopy, because of spasmodic pain in the bladder associated with loss of control and discomfort in the perineum. Cystoscopy revealed no abnormality.

In June, that is, two months later, the patient was worse and was cystoscoped again by another surgeon, who found that the bladder urine contained a great deal of pus and the bladder was generally inflamed. He also discovered a fissure *in ano* with a spastic anal sphincter. The fissure was excised and bladder irrigation started. A study of the blood was done at that time. The red cells numbered 4,450,000; white cells 5,200; hæmoglobin 77.1 per cent; polymorphonuclear leucocytes 68, large lymphocytes 6 and small lymphocytes 26 per cent. The blood Wassermann test was negative, and the blood chemistry normal.

In August, 1931, I first saw this patient. She was emaciated and exhausted. She had bladder spasms at least once every minute, accompanied by dribbling of urine, perineal distress and at times bowel incontinence. From the history alone cord changes were suspected as the cause of these symptoms, and a blood study on August 21, 1931, revealed a red cell count of 3,256,000, white cells 5,300, hæmoglobin 84 per cent. The blood smear contained many macrocytes, a few microcytes, and anisocytosis was marked. A diagnosis of pernicious anæmia was made, and liver extract and cod liver oil administered. On September 18, 1931, the red cells numbered 4,160,000, and the hæmoglobin was 90 per cent; on September 25, 1931, the red cells were 4,648,000, white cells 7,200, and hæmoglobin 94 per cent. The blood smear still contained macrocytes, microcytes and poikilocytes. The patient was by that time in fit condition to leave hospital. Complete bladder and rectal control returned later, and the patient is still an arrested case, according to a recent report from her physician.

One, therefore, should not be content with one blood examination when cord changes are present and no other cause for them can be found. Neither should one be too pessimistic as to the prognosis, even when ataxia is

marked and paræsthesia extreme. The subjective symptoms may on adequate treatment disappear entirely, but the objective signs, such as loss of vibration sense, and two-point discrimination, will remain.

The early symptoms of pernicious anæmia may be associated with arthritis or simulate arthritis, and only a very careful history and examination will enable one to differentiate the one from the other. This may be illustrated best in probably the earliest recognized case of pernicious anæmia that I have seen.

CASE 2

I first saw Mrs. A. A., aged 61, in consultation in 1927. She had had pain in the back at irregular intervals for years, but more severe during the preceding summer. She had badly infected tonsils, tenderness over the left 6th and 7th intercostal nerves, and a pessary, which she did not know was there, but remembered it being inserted thirty years previously. The pessary had ulcerated into the posterior fornix, and the mucosa healed over it, so that half of the instrument was buried in the soft tissues. The pessary and tonsils were both removed two weeks later. In 1927 this patient's blood picture was as follows: red cells 5,056,000, white cells 11,600, and hæmoglobin 84 per cent. The character of the red cells and the differential white count was normal. After removal of the foci the patient's condition was improved, but about once a year she was incapacitated with an acute attack of arthritis. Her blood picture, done repeatedly, was not significant.

In March, 1933, this patient was admitted to hospital, because of distress in her legs and shoulders, and inability to walk. On inquiring closely into the history as to the types of sensations experienced, it became evident that there were two distinct types of sensation in the left leg. There was the ache and crepitus in the knee, typical of arthritis, but there was also a sense of heaviness and numbness in the leg that did not fit in with arthritis or the picture formerly presented by this patient. Direct inquiry then brought forth a history of a moderate sore tongue for a few weeks, loss of appetite and an indefinite gastric uneasiness. Pernicious anæmia was suspected, and a blood study revealed a red cell count of 4,084,000, white cells 5,000, and hæmoglobin of 88 per cent, with many macrocytes, a few microcytes, and some anisocytosis. Note that as yet actual anæmia had not made its appearance, either clinically, or in any gross change in the number of red cells, or the percentage of hæmoglobin, but a plus index was present, and, most important of all, the average size of the red blood cells was greater than normal. The patient's physician reports satisfactory improvement on a high vitamin and liver diet.

Our predecessors depended almost entirely on their keen senses to make their diagnoses. Why do we make so many inexcusable errors, unless we are becoming sluggish in perception and thought?

CASE 3

I saw a case of pernicious anæmia last November that any fifth year student should have diagnosed provisionally as such, if he had met him casually on the street, yet this man stated that during the last year he had had at least four or five life extension

examinations, and the last one just one week before I saw him. On each examination, even the last one, he was pronounced normal. This man was sixty-seven years of age. He had an increasing yellow tint to his skin of three months' duration, which was noticeable to himself and his family. Dyspnoea on exertion had been present for four months, and præcordial distress on exertion for six weeks. He had loss of appetite, and was tired all the time. There was no history of sore tongue or paræsthesia. His pulse was 120, his heart was enlarged, and the heart sounds were of poor quality. He had a distinctly yellow skin, with no change in his sclera. The red cell count was 1,550,000, white cells 4,000, and hæmoglobin 32.6 per cent, with a smear typical of pernicious anæmia.

I should like to say that life extension examinations done in such an unseeing manner as those which this patient had cannot be condoned by anyone, and do more harm than good, because they may in some cases give a patient a false impression of security, thus delaying treatment that should be initiated at once. Many are under the impression that patients who have had secondary anæmia will not develop pernicious anæmia, or, to put it in another way, secondary anæmia will not progress into pernicious anæmia. This idea is entirely erroneous. The secondary anæmia may not develop into pernicious anæmia, but any patient with one disease may develop another, and the two types of anæmia may appear at different times in the one patient.

CASE 4

Mrs. E.W.B., aged 34, had fought secondary anæmia all her life. Her father and mother both died of pernicious anæmia, and one brother died of some blood dyscrasia, possibly pernicious anæmia. Early in January 1928 she had a severe tonsillitis. Examination on January 30th revealed large, infected tonsils, and no other physical abnormality. Her red cells numbered 4,472,000, white cells 15,200, and hæmoglobin 70 per cent. Her tonsils were removed February 8, 1928. On March 26, 1928, she was complaining of weakness and fatigue. Her red cells were 3,640,000, white cells 6,000, and hæmoglobin 56.2 per cent. There was nothing in this blood count to suggest pernicious anæmia, but her physician recommended that she take some liver, which she did very sparingly. In August she felt worse than ever, but was taken on a motor trip, which resulted in her breaking down entirely. She was next seen by us on August 19, 1928; she was very weak, icteroid, vomiting her food, and had a sore tongue and tingling in her feet. Her red cell count was 2,536,000, white cells 2,200, and hæmoglobin 53.4 per cent, with macrocytes, microcytes, poikilocytes and anisocytosis present in the smear. On adequate liver and vitamin treatment she progressed favourably, and on October 23, 1928, her red cells were 5,528,000, white cells 7,800, and hæmoglobin 77.1 per cent, and the blood smear was improved.

This patient presents one of the commoner problems in management, as she has a marked distaste for liver. She carried on very well on liver extract for a time, but in October, 1929, November, 1930, and September, 1931, she had a certain degree of blood relapse, and a systemic relapse² as well. In 1931 she almost lost the use of her legs. Since 1931 she has taken cod liver oil a great deal of the time, continuing with liver

extract by mouth, and once in six weeks gets liver extract intravenously.

She had no more relapses until November, 1932, when she became pregnant. Distaste for food developed, and nausea and vomiting were very troublesome. Progressive weakness, increasing paræsthesia, and difficulty in walking developed rapidly. It seemed improbable that one could guide her through to term with satisfactory results. After consultation a therapeutic abortion was carried out. A rapid return to her former state of health followed this procedure.

I have tried to bring out in these remarks the importance the history has in leading one to suspect pernicious anæmia before it is well marked. There is a history of sore tongue before atrophy is apparent. There are disturbances of sensation described by the patient and abnormalities found in examination; that is, loss of vibration sense, and two-point discrimination, before there is unsteadiness in walking. There may be a family history, but not always. There are weakness, fatigue, gastro-intestinal disturbance and loss of appetite; there are often neurological changes before there is any clinical sign of anæmia.

If one is doing general practice, and not in the habit of doing blood studies, or not equipped to do them, one can easily make several blood smears on ordinary slides, let them dry, and send them to a reliable laboratory. The most important diagnostic point in the blood picture of pernicious anæmia is the average increase in the size of the red blood cells. The trained technician or physician, accustomed to examining blood smears, can frequently tell enough from the smear alone to enable one who already has a good clinical knowledge of a case to make a positive diagnosis. Rough estimations of hæmoglobin are of no value. The ratio of red cells to the percentage of hæmoglobin, accurately done, is of value. The colour-index is always one or one plus in untreated pernicious anæmia. A quick and satisfactory way to estimate the colour-index is to multiply the first two figures of the red cell count by two, then divide the figure representing the percentage of hæmoglobin by this figure. For example: With a red cell count of 2,500,000 and a hæmoglobin of 53 per cent, the colour-index is $53/50$, or 1.06, or a plus index; whereas, if the red cell count were 3,500,000, and the hæmoglobin 53 per cent, the colour-index would be $53/70$, or 0.75714, a minus index. This is very simple, but I find many physicians unable to calculate colour-index.

The management of pernicious anæmia cases is not as simple as one might think. You can-

not tell them to eat half a pound of liver daily, and lose interest in them thereafter, and not come to grief in many instances. Pernicious anæmia is a disease of exacerbations and remissions, and we now know that even under liver treatment exacerbations will occur. These may take the form of a blood relapse, if the amount of liver taken is inadequate, or systemic relapses, with loss of appetite, weakness, numbness and tingling. If insufficient vitamins are taken in the diet; systemic relapses may occur while the blood remains at a normal level, and may involve one or more of the following systems—the nervous, the gastro-intestinal, the bone and joint, or the muscular. These relapses are likely to occur during the season in which the patient first broke down. When first put on treatment, patients should be warned of the possibility of relapses, and the necessity of adhering rigidly to treatment. Like diabetics, they should report regularly for a check-up, not only of their blood but a general physical examination with special attention to signs of cord changes. The treatment for cord lesions is not liver so much as cod liver oil and a high vitamin diet.

The exact treatment for any patient has to be worked out according to that patient's requirements, so that a careful follow-up of the case is important. It is much safer to give too

much liver than not enough, and all cases would be safer to take cod liver oil from October to the end of March. I prefer giving whole liver lightly cooked, if patients will take it, but liver extracts by mouth, intramuscularly and intravenously, all have very important places, and at times a patient will do better on ventriculin than on any other preparation.

I cannot condemn too strongly the fairly common practice of placing anæmic patients on liver before a definite diagnosis is made as to the type of anæmia being treated. Liver is of some value in secondary anæmia, because of its high vitamin content, but it changes the blood picture in pernicious anæmia so markedly that often after liver therapy it is difficult to be sure if the disease is pernicious anæmia. It is important to know, because in secondary anæmia the patient does not need to continue liver, while in pernicious anæmia it is important that liver should be persisted with at all costs. Frequently, after a pernicious anæmia patient has been on treatment for some time the only hint one has from the blood study as to the true diagnosis is the predominance of older leucocytes in the differential count. This is called a shift to the right, and is recognized by the increase over normal of multinucleated leucocytes.

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DIABETIC COMA REFRACTORY TO INSULIN*

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THE action of insulin in the human body is as yet incompletely understood. It was at one time believed that all diabetics suffered from pancreatic damage with resulting impairment of insulin secretion, and that the administration of that hormone corrected the deficiency. That there are cases of this disease in which no pathological changes are found is now common knowledge. Various theories based on animal experimentation have been advanced to explain these. La Barre's conception of a sugar centre in the brain is an example. Houssay also has shown that the removal of the pancreas from dogs causes diabetes, but if both pancreas and pitu-

itary are extirpated at the same time no diabetes follows. If now hypophyseal tissue is grafted under the skin of such an animal severe diabetes results. This work shows the influence of the hypophysis over carbohydrate metabolism. Then there is the supposition of a counter regulation of insulin brought forward by Falta. This is founded on the well known fact that thyroid extract and adrenalin oppose the action of insulin.

Clinical experience has shown that some diabetic patients appear to be refractory to insulin. Tannhauser and Fuld have divided all the reported cases into four groups.—

First: Those cases in which marked glycosuria is present while the blood sugar remains normal or even below normal figures. These are

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often erroneously considered as cases of renal diabetes.

Second: Cases with hyperglycæmia which need large doses of insulin to become sugar free, and even when the sugar output is controlled require excessive doses. In such these authors believe there are pancreatic and extra-pancreatic factors to be considered.

Third: Patients with hyperglycæmia, acetonæmia and acetonuria. Here large doses are necessary to make the acetonuria disappear. There is usually some fever or an infection present. With the relief of these the insulin dosage returns to normal.

Fourth: "Insulin refractory" cases. So Thannhauser and Fuld designate a class of true pancreatic diabetes, to which is added a second condition of unknown origin. Failure of intermediate metabolism is present. This is argued from the fact that in true pancreatic diabetes insulin is usually successful in counteracting coma. They suggest that there is a ferment in the liver which is responsible for the synthesis of glycogen. In the refractory type this ferment is either destroyed or combated by adrenalin, thyroid or pituitary secretions.

A case is described by these writers which they believe belongs to the latter group, and they state that it is the only one yet reported. In commenting on four cases of somewhat similar character published by Rathery and Sigwald, and by Marcel Labbé and Boulin, they maintain that the data supplied are insufficient to establish the diagnosis of insulin resistance as described in group four. In one the patient did not respond to 470 units of insulin, but only one sugar determination was made; in another gangrene and pneumonia were present; a third had 300 units of insulin without response, but neither blood nor urinary findings were recorded.

The case described by Thannhauser and Fuld showed gradually increasing resistance over a period of twelve days, and then coma similar to true diabetic coma developed. This was present for 34 hours before death ensued. The blood sugar was 0.412 per cent when coma came on. In the first 24 hours 350 units of insulin were given subcutaneously and 10 intravenously. The final eleven hours saw the exhibition of 170 units subcutaneously and 1060 intravenously. The blood sugar reached a height of 0.950 per cent, but had fallen to 0.530 per cent shortly before

death. They do not mention the CO₂ combining power of the blood nor the autopsy findings.

Because of the rarity of cases of coma refractory to insulin the following is of interest:—

A woman, A.W., aged 58, was admitted to the University Hospital in deep coma after eighteen hours' abstinence from food and insulin. There had been repeated vomiting during this period. Three years before she had been under the writer's care, having then suffered for three years from diabetes. She left hospital on a low fat, high carbohydrate maintenance diet, with 45 units of insulin daily. She had not reported in the interval, but her husband said that she had remained in good health as long as she adhered to her diet and insulin. A trip to the city resulted in a visit to an irregular practitioner who said he could do nothing for her until she stopped taking insulin. This resulted in coma. The accompanying Table gives all the essential data.

COMMENTS

This case seems to belong to the fourth group, as outlined by Thannhauser and Fuld. It will be noted that there was very little change in the blood sugar throughout the duration of the coma. The CO₂ combining power rose from 11 vols. per cent to 37.5 vols. per cent, but even with continued excessive dosage of insulin it fell again. The urine was never free of sugar nor ketone bodies. No evidence of sepsis was found at autopsy. In 14 hours 1140 units of insulin were given. An autopsy was performed by Dr. John W. MacGregor. The important facts were as follows:—

Cranium.—Not examined.

Thorax.—Lungs normal, excepting for dense adhesions at apices, with some local areas of fibrosis in upper lobes; other lobes voluminous and crepitant.

Thyroid.—Negative.

Thymus.—Not appreciable.

Heart and Great Vessels.—Heart, negative. Aorta—a few atheromatous plaques, but no areas of ulceration nor calcification. Coronary arteries, patent throughout. No marked sclerosis.

Abdomen.—Old fibrous adhesions around gall bladder, which contained numerous calculi. Wall not markedly thickened.

Liver.—Negative.

Pancreas.—Small, but otherwise showed no gross abnormality. Weight 60 gm.

Spleen.—Small. Negative.

Kidneys.—Showed deep irregular pitting on cortical surfaces.

Histological findings: Pancreas.—Sections showed marked diminution in the number of islets of Langerhans. Those present were small and the cells atrophic in appearance.

Liver and heart muscle, negative.

NOTE: My thanks are due to Dr. Max Kanter, of the Department of Biochemistry, and to Helen McCuaig, B.Sc., of the Department of Metabolism, for the biochemical tests which were done and repeatedly checked during the night.

The insulin used was from the Connaught Laboratories. The lots used were later checked by them and found up to standard.

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COMA RECORD

TABLE

MRS. A. W.

Time	T. P. R.	Blood			Urine					Blood Pressure	Medication		Remarks
		Sugar	Co ₂	Chl.	Output	S.G.	Alb.	Gluc.	Acetone		Units Insulin	Other	
8.00 p.m.	98°/104/40	% 0.356	Vols. % 11	% .370	210 c.c. cath.	1020	+	+++	+++	132/96	50	.....	No chlorides in urine. Kussmaul breathing. Intraocular tension very low. Halometer 4.5. Blood NPN, 40 mgm. %. Cholesterol. W. B. Cells, 26,150. Hb. 113%. R. B. C., 4,620,000.
8.30 "	97 ² °/100/32	.....	..	..	..	..	..	..	..	128/88	..	.....
9.00 "	96°/100/36	0.337	18	..	..	..	..	..	..	..	80	600 c.c. interstit. saline	Pupils contracted, react to light.
9.30 "	97°/96/40	.....	..	..	..	..	..	..	..	..	80	..	
10.00 "	96 ² °/96/40	0.337 after intrav.	18	..	..	..	..	..	..	120/70	80	750 c.c. 5% intrav. gluc.	
10.30 "	96 ² °/100/40	.....	..	..	..	..	..	..	..	..	..	..
11.00 "	96 ³ °/96/40	.....	..	..	..	..	..	..	..	108/76	80	..	
11.15 "	..	.....	..	..	..	..	..	..	..	96/76	..	..
11.30 "	99 ³ °/96/32	0.347	23	..	..	..	..	..	..	108/78	..	..
12.30 a.m.	96 ¹ °/100/40	.....	..	..	..	..	..	..	..	..	..	..
1.00 "	96°/100/40	.....	..	..	960 c.c.	1022	+	+++	+++	..	120	1,000 c.c. 5% glucose in N. saline intrav.	
1.30 "	96 ² °/112/40	0.376	25	..	..	..	..	..	..	104/72	80	..	Kussmaul breathing. Blood pH. 7.14 Intraocular tension improved. Breathing improved, not so deep.
2.00 "	96°/112/36	.....	..	..	..	..	..	..	..	..	..	..
2.30 "	96°/112/44	.....	..	..	..	..	..	..	..	..	120	..	
3.00 "	96°/120/36	0.356	37.5	..	..	..	..	..	..	108/68	..	..	Kussmaul breathing again.
3.45 "	.....	.....	..	..	..	..	..	..	..	98/68	50	850 c.c. 5% glucose to 5 a.m. 50 units intravenously.	
4.00 "	97°/108/48	.....	..	..	..	..	..	..	..	102/58	80	..	Breathing became more regular at intervals but resumed Kussmaul form again.
4.45 "	97°/108/48	.....	..	..	..	..	..	..	..	..	..	..
5.30 "	97 ³ °/104/40	.....	..	..	..	..	..	..	..	90/50	..	Adren. M +	Breathing easier but shallow. Still unconscious. In 5 min. B.P. 100/60. In 8 min. B.P. 102/60. In 15 min. 100/60. In 25 min. 110/60. 25 min. after adrenalin, diastolic stopped about 55 and distinct swish down to zero.
6.15 "	.....	0.337	27.5	..	1080 c.c.	1020	+	+++	+++	..	120	..	
6.45 "	98 ² °/116/38	.....	..	..	..	..	..	..	..	..	..	..	Pupils contracted, but respond to light. Body and hands feel warmer.
7.30 "	.....	.....	..	..	..	..	..	..	..	92/50	..	..
8.00 "	104/32	0.356	15.5	..	..	..	+	+++	+++	88/44	80	..	Pupils less contracted. React normally to light. Arms flaccid, pupils normal, good reaction. Eyeball more firm. Breathing shallow, no cyanosis. Halometer 4.9. Blood pH. 7.
8.30 "	.....	.....	..	..	..	..	..	..	..	78/44	..	..
10.00 "	98 ³ °/112/38	.....	..	..	..	..	..	..	..	64/42	120	..	
10.35 "	.....	.....	..	..	..	..	..	..	..	60/44	..	Intraven. 750 c.c. N. saline	
12.00 noon	98 ⁴ °/110/36	.....	..	..	..	..	..	+++	+++	68/38	..	..	Pupils still react normally to light.
1.00 p.m.	.....	.....	..	..	..	..	..	..	..	..	..	..	Ceased to breathe.
Total insulin...											1140	..	

THE EARLY DIAGNOSIS OF CANCER OF THE LARYNX*

BY G. EDWARD TREMBLE, M.D.,

Montreal

VII

THE successful treatment of this condition depends upon early diagnosis and complete surgical removal. Within the past few years the mortality rate of cancer in this situation has decreased considerably, owing to the selection of patients, careful pre-operative treatment, improved methods of anæsthesia, perfection of surgical technique, and proper post-operative care. To reduce the mortality further it is necessary for the medical practitioner to recognize the symptoms and features of the disease while it is still localized and before metastases have occurred.

Occurrence.—Approximately 4 per cent of all malignant tumours occur in the larynx. Of these about 98 per cent are epitheliomata (squamous-celled carcinomata) and 2 per cent sarcomata.

Etiology.—It is interesting to note that a large number of cases are reported in which the patient was addicted to alcohol and tobacco, with their accompanying local irritation. Over-straining and the improper use of the voice have also been mentioned as probable causes.

Age.—Malignant growths of the larynx are rarely met with under 40 years of age; not infrequently between 40 and 50; but most commonly between 50 and 60.

Sex.—Females rarely suffer from cancer of the interior of the larynx; when they do exhibit malignancy it is usually primary in the pharynx, and spreads to the larynx by continuity. The male sex, however, is affected to the extent of about 90 per cent.

As a rule laryngeal cancer is not recognized early enough to permit of proper surgical treatment. Although many patients do not seek advice until the condition is inoperable, in the past a great number have been under observation and treatment for months without

being diagnosed as cancer. Fortunately these cases have been decreasing in recent years.

CLASSIFICATION

Cancer of the larynx is found in one of two forms, depending on the point of origin. In one form surgical treatment gives brilliant results, while in the other it is hopeless, due to early metastases.

Fifty years ago Krishaber divided malignant growths of the larynx into two groups according to the anatomical site of origin of the disease:—

Intrinsic.—Those arising from the cavity of the larynx; the true and false vocal cords, the ventricles, the interarytenoid region and the subglottic space.

Extrinsic.—Those arising from other parts of the laryngeal mucosa; the aryepiglottic folds, the arytenoids, the pyriform sinuses, epiglottis, and post-cricoid area.

Mixed.—A combination of intrinsic and extrinsic, including those growths where the origin cannot be determined.

Recently the growths of the subglottic space have been separated from the intrinsic group. In this type of tumour the area just below the glottis anteriorly is usually affected and the inner and under surfaces of the vocal cords.

The intrinsic form, *i.e.*, true intra-laryngeal cancer, remains longer a purely local affection, owing to its location within a cartilaginous box from which the lymphatics have an attenuated connection with the glands of the neck, and not until the disease is far advanced are the neighbouring lymphatic glands infected.

In the extrinsic form—that arising primarily outside the larynx, but afterwards invading it from the pharynx—gland infection appears as a rule in the early stage, and metastasis more frequently occurs.

SITUATION

Although cancer may involve any part of the larynx, the most frequent site is the anterior half of the vocal cord, where it remains localized for some time. This explains the necessity of an early diagnosis and the reason

* Previous articles in this series can be found in the *Journal* as follows:— 1933, 29: 465; 1934, 30: 46, 48, 50, 168 and 171.

for the successful results of surgery in this situation. In extrinsic laryngeal cancer the posterior surface of the cricoid is most often affected. This type is far more common in women than in men.

SIGNS AND SYMPTOMS

The early signs vary a great deal, depending on the situation and extent of the growth. Unfortunately for the patient, considerable time elapses before cancer of the larynx produces sudden or painful symptoms.

Persistent hoarseness, which is so characteristic of the early intrinsic form, is often tolerated by the patient as an inconvenience, while his physician, if consulted at all, may regard the condition as "chronic laryngitis" without an examination of the affected region. The lack of warning is still more marked in the early phases of the extrinsic type, for in this there may not be the slightest alteration in the voice, neither pain nor any other symptom, until perhaps a glandular swelling appears behind and below the angle of the jaw. It is extremely important that the patient and physician do not wait for well developed symptoms to appear, such as, dysphagia, dyspnoea, hæmorrhage, salivation, glandular swelling, fetor or cachexia. These are late signs, and operation at this stage is hopeless. *Any patient over 40 who has hoarseness or a continued alteration of the voice for more than three weeks should be thoroughly examined by a skilled laryngologist.*

Pain as a rule is a late manifestation, particularly in the intrinsic form of the disease. When it does occur, the pain usually radiates to the ear or the side of the head. With extrinsic cancer pain is an earlier, and often a more disturbing, symptom, and is apt to be accentuated by the act of swallowing. It is most frequently met with in disease of the epiglottis and of the posterior surface of the cricoid.

Cough is not an early symptom in either intrinsic or extrinsic cancer, but it may be present in the later stages of either variety, when excessive secretion of mucus or discharge from the growth collects in the lower part of the pharynx.

Dyspnoea and stridor are late symptoms, but earlier in their onset in the intrinsic type.

Difficulty and pain in swallowing are early signs of extrinsic carcinoma, especially when

the epiglottis is involved. Neither of these symptoms may be manifested in the intrinsic variety, and if they are it will generally be during the late stages of the disease.

Blood-stained expectoration, foul breath, and bleeding from the throat denote ulceration of the growth, with invasion of the deeper tissues, and, possibly, involvement of the cartilaginous framework of the larynx.

Cachexia, enlargement of the cervical glands, and a rapid deterioration of the general health, are symptoms which herald the termination of the disease in both intrinsic and extrinsic laryngeal cancer, but their onset is much earlier in the last-named, because of the free lymphatic anastomosis with surrounding parts.

EXAMINATION

In order to obtain a clear view of the larynx it is necessary for the physician to be familiar with the head mirror, reflected light, and the laryngeal mirror. Early growths of the vocal cords present a great variety in colour, form and situation. Occasionally an epithelioma is

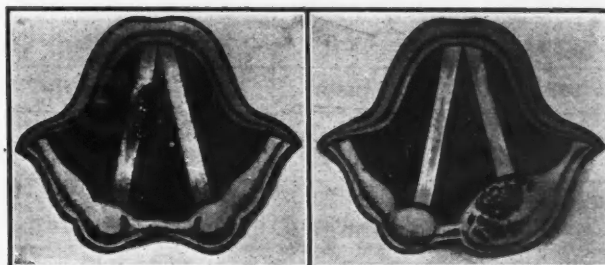


FIG. 1.—Intrinsic cancer. FIG. 2.—Extrinsic cancer.

The above drawings by the author from actual specimens, as seen in the mirror with reflected light, illustrate two forms of cancer of the larynx.

Fig. 1 shows an epithelioma of the right vocal cord, the most favourable situation from an operative point of view.

Fig. 2 demonstrates a malignant ulceration of the left aryepiglottic fold showing the accompanying swelling. Any procedure short of hemi or complete laryngectomy in such a case would be of little or no avail.

seen as a congestive thickening of one vocal cord, but possibly the commonest and most typical appearance is that of a pinkish-grey, sessile wart, involving the upper surface and free edge of a portion of the cord. In time the movement of the cord becomes restricted, and if the growth progresses fixation occurs. At a later stage when ulceration has occurred, with the formation of a greyish-white slough, the diagnosis is more apparent.

As a rule the malignant nature of extrinsic growths is more obvious than in the intrinsic forms, especially when the disease commences in the epiglottis or aryepiglottic fold. To one

who is familiar with the normal laryngoscopic picture it is not difficult to discern an ulcerated swelling or excessive granulations with œdema in this region. When the arytenoid joint is affected the vocal cord of that side is often involved and fixed in some atypical position.

DIFFERENTIAL DIAGNOSIS

Carcinoma of the larynx must be differentiated from *syphilis* and *tuberculosis*. *Lupus*, *actinomycosis* and *chronic catarrhal laryngitis* less frequently resemble malignancy.

Carcinoma is usually a disease of later adult life and is rather infrequent before fifty. *Tuberculosis* is frequent from twenty to forty-five or even fifty; it is rare before fifteen and after

DIAGNOSTIC TABLE

Signs, Symptoms and Tests	Laryngeal tuberculosis	Syphilis	Carcinoma
Hoarseness.....	Early	Early	Early
Aphonia.....	Late	Late	Late
Early pain.....	Rare	Frequent	May occur
Late pain.....	Frequent	Frequent	Very often
Dysphagia.....	Early	Early	Early
Odynphagia.....	Late	Late	Early
Bacteria.....	Tubercle Bacilli	Spirochæta Pallida	?
Presence of sputum.....	Frequent	Rare	Rare
Lungs.....	Pulmonary Tuberculosis	Negative	Negative
Blood Wassermann...	Negative	Positive	Negative
Spinal-fluid Wassermann...	Negative	Positive	Negative
Roentgenogram of lungs.....	Positive	Negative	Negative
Biopsy.....	Tubercles	Gummata	Carcinoma

fifty. Cancer is often unilateral in the early stage, while tuberculosis is usually bilateral, even though more extensive on one side than the other. The lungs are free from tuberculosis as a rule in patients with carcinoma.

Syphilis must, so far as this is possible, be excluded by a thorough general physical examination and the roentgen-ray. A negative history of lues counts for very little. The blood, and, in some cases, the spinal fluid should be tested for the Wassermann reaction.

A careful examination of the lungs by a competent internist, supplemented by stereoscopic roentgenograms, and repeated examinations of the sputum by an expert bacteriologist will often result in the proper diagnosis. Animal inoculation should be resorted to in case tubercle bacilli cannot be found in the sputum. Biopsy is rarely a justifiable procedure for the diagnosis of laryngeal tuberculosis, but is generally considered so for the diagnosis of carcinoma.

The Table (see col. 1) shows a comparison of the important signs, symptoms and tests in the three diseases.

At times it is difficult to distinguish a simple, innocent tumour from an early malignant growth. It is only with the assistance of laryngoscopy that the diagnosis can be made. Occasionally a decision is not reached until a piece of the growth is removed and examined under the microscope. Clinically, the chief points of difference are summed up below.

Benign Tumour	Malignant Tumour
Rare after 50.	Rare under 40 and usually occurs over 50. Occurs anywhere on the vocal cord or elsewhere. A single growth on the aryepiglottic folds or on the epiglottis is always suspicious in patients over 45.
Grows away from the tissues.	Invades the tissues.
Base of growth, or pedicle only, inflamed during laryngitis.	Inflamed base.
May impair the action of a cord mechanically.	Impairment of a cord due to infiltration is strongly suspicious.
No ulceration.	Tends to ulceration.

PROGNOSIS

If left untreated, intrinsic as well as extrinsic carcinomata are inevitably fatal. In the former the termination may be delayed three or four years when the disease is of slow growth. The extrinsic type is more rapidly fatal, and life will rarely be prolonged for more than eighteen months or two years. If intrinsic cancer of the larynx is diagnosed during its early stages, and the general health of the patient is good, the prognosis after radical operation is better than that of malignant disease in any other part of the body. The more centrally the growth is placed, the better is the outlook.

This applies particularly to a localized cancer of the vocal cord, because malignancy here tends to extend along the cord and involve it in its entire length before spreading further. Later, if the growth progresses and breaks through the cartilaginous walls of the larynx, it becomes extrinsic and in time inoperable.

TREATMENT

As the purpose of this paper is to present the diagnostic features of cancer of the larynx to the physician very little need be said regarding treatment. Early and free removal of the growth, perhaps supplemented with radium, gives the best chance of cure. In removing the tumour it is important to include an area of surrounding healthy tissue. Each case has to be considered carefully and judged on its own

merits before deciding on the operation of choice. At times a relatively simple procedure is sufficient, while in others it may be necessary to remove one-half or even the whole larynx. The risk is great, it is true, but if a radical operation is not performed a fatal result is certain. The most successful results are obtained in circumscribed intrinsic cancer involving one vocal cord. By means of thyrotomy or laryngo-fissure the affected cord is removed through an opening made by splitting and separating the two halves of the thyroid cartilage. Extrinsic growths are seldom, except at an early stage, capable of efficient treatment without radical measures. Later, the treatment becomes palliative. Radium and x-rays, as adjuncts to surgery, are valuable aids in inhibiting the spread of the disease.

THE EARLY DIAGNOSIS OF CARCINOMA OF THE LUNG*

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VIII

ALTHOUGH the term "carcinoma of the lung" is used in a general way to describe tumours occurring in the lung, it is really in most cases too broad a term. The vast majority of primary tumours in this organ should more properly be designated "carcinoma of the bronchus". Other primary neoplasms in this organ are comparatively few and are supposed to arise from the alveolar epithelium or the interstitial pulmonary structures. It is true that sarcoma of the bronchus, although unusual, is not rare; but, from the point of view of early diagnosis the exact character of the bronchial tumour can only be determined by microscopic examination, the symptoms and signs being to all intents and purposes identical.

The period for early diagnosis of these tumours may be defined as that time during which the original tumour is still localized and has not as yet involved either the peribronchial and mediastinal glands or any other adjacent structure, and before extensive pulmonary, pleural, or distant metastases have occurred.

The most important factor in advancing the successful treatment of cancer by our present methods is to be looked for in early diagnosis. This not only applies to cancer in general but also to cancer of the bronchi in particular, and must be accomplished in the first instance by proper emphasis being placed on a few important signs and symptoms.

It may be stated in general that cancer over a long period is usually a symptomless disease, unless it give rise to the excitation of some recognizable reflex, interferes with the normal function of an organ, or ulcerates and produces hæmorrhage. It is *per se* a *painless lesion*. This general statement can be taken literally to apply to many regions, but naturally there are exceptions, such as the skin and the breast, where an ulcer or tumour may be seen or felt.

One of the difficulties in the early diagnosis of carcinoma of the bronchus has been the faulty description of the symptomatology and signs of this disease in most text-books. Too much emphasis has been placed upon the presence of *fever*, *leucocytosis*, and *cachexia*. These are *not* signs of cancer of the bronchus, but are produced by bronchiectasis and pulmonary abscess, which frequently develop

* Previous articles in this series can be found in the *Journal* as follows: 1933, 29: 465; 1934, 30: 46, 48, 50, 168, 171 and 280.

secondary to the cancer. In other instances much emphasis has been placed upon widespread or distant symptoms and signs, such as *pleural effusion, mediastinal obstruction, pains in the limbs and other portions of the body*, and signs pointing to *cerebral or spinal involvement*. Such signs and symptoms are caused by metastases. Carcinoma of the bronchus is notorious for producing early and widespread secondary lesions, due, no doubt, to the early invasion of a small pulmonary vein.

When one comes to consider the early symptomatology of carcinoma in this region there is one symptom which stands out pre-eminently above all others, namely, *cough*. As carcinoma of the bronchus develops as a foreign body within this organ it is natural to expect that the cough reflex will be early stimulated. Any person over 30 who develops a persistent cough, which may or may not be paroxysmal, with or without sputum, where tubercle bacilli cannot be demonstrated, which resists ordinary methods of treatment and cannot be ascribed to a definite local irritation, must be considered—until proved to the contrary—as suffering from a bronchial new growth. It must always be borne in mind that about half the cases of carcinoma of the bronchus occur before the age of forty-six.

Cough usually precedes all other symptoms by weeks or months. It is not distinguished by any peculiar features, unless it be the frequency of its paroxysmal character and the fact that it may be unaccompanied for a considerable period by sputum. A brassy cough is not characteristic of carcinoma of the bronchus until such time as pressure symptoms occur, which are usually produced by metastases.

The next most important symptom in the order of occurrence is *sputum*. This in the early stages is usually scanty and more or less mucoid, although in certain instances a copious expectoration may appear. Likewise, small hæmorrhages may occur and the sputum will often be persistently blood-tinged. The "currant jelly" type of sputum is not often found, but when it does appear is of considerable importance, as it usually indicates a rather extensive papillomatous growth with considerable superficial ulceration. Therefore, blood-streaked sputum is a most important sign, particularly when the tubercle bacillus cannot be demonstrated.

The next group of symptoms is not due to the primary local lesion but either to bronchial obstruction or pressure on the bronchus or surrounding structures, and is therefore usually attributable to metastases or direct extension of the growth. *Dyspnœa* is not as a rule a prominent feature in the early stages unless the neoplasm should occur in a bronchus close to the bifurcation of the trachea, obstructing one bronchus and impinging upon the inlet of the other. When dyspnœa is produced by external pressure the lesion is no longer in its early stages but extensive mediastinal involvement has occurred.

Other symptoms that appear at this stage are the brassy cough already noted, the *tubular wheeze* or blow on auscultation over the bronchus, and paralysis of one or other (especially the left) recurrent laryngeal nerve, pressure on the superior vena cava leading to *dilatation of the veins of the upper thoracic wall and neck*, and *dysphagia*.

It may, therefore, be definitely stated that the early diagnosis of carcinoma of the bronchus depends upon the occurrence of unexplained persistent cough, with or without sputum and hæmoptysis. The differential diagnosis in the vast majority of cases is from tuberculosis, which differentiation of course depends upon the presence or absence of the tubercle bacillus.

The absolute diagnosis of early carcinoma of the bronchus can only be accomplished by instrumental and histological methods. The x-ray alone is of but little help, because when a shadow has appeared it indicates that the lesion has extended beyond its original site and has involved either the surrounding parenchyma of the lung or the peribronchial or mediastinal glands. On the other hand, the visualization of the bronchial tree by the use of lipiodol or other liquids giving an opaque shadow with the x-ray frequently give most important evidence. These substances may be introduced either by a bronchoscope or by other simpler means. When the bronchi are outlined a filling defect is frequently demonstrated by x-ray. These filling defects, however may not always be due to new growth, but, if no history of the possible introduction of a foreign body can be obtained, a positive diagnosis of new growth is almost certain. Such filling defects may be demonstrated beyond the

vision of the bronchoscope. The bronchoscope, however, affords the greatest amount of positive evidence if the lesion can be seen. The characteristic of a neoplasm of the bronchus as seen by endoscopy is a loss of elasticity of the bronchus, with a tough or woody quality to the tube, and the lesion may have a macular quality. There may or may not be evidences of ulceration and in such cases material for a biopsy is hard to obtain. In others, however, there may be a more or less papillomatous appearance. In these latter, to obtain a small

clipping is of the utmost importance, as then by histological methods an absolute diagnosis may be made.

In recapitulation, it may be stated that the following points are of the greatest importance in the early diagnosis of carcinoma of the bronchus, viz., *cough, sputum, hæmoptysis, a filling defect*, as shown by opaque visualization of the bronchus, a *macular or papillomatous thickening of the mucous membrane* as seen by the bronchoscope, and a clipping of such tissue giving the histological appearance of carcinoma.

MÉNIÈRE'S DISEASE, WITH REPORT OF A CASE*

BY J. E. WHITWORTH, M.D., C.M.,

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BRIEFLY, the symptom-complex known as Ménière's disease is characterized by a sudden and complete loss of hearing on the affected side, attended with tinnitus, nausea, vomiting, spontaneous nystagmus, and vertigo, and is frequently accompanied by a period of unconsciousness—these all in the absence of a previous history of ear disease. The hearing by bone conduction is lost if the lesion is bilateral, a rare occurrence, and when unilateral the sound of a tuning fork placed over the vertex is heard only on the unaffected side. The unconscious period clears and the patient remains nauseated and vomits repeatedly for a few hours to a few days. The dizziness, staggering gait and tendency to walk to the affected side persist longer. Following the apoplectiform attack of the onset, the patient is dull and dazed for a period, and all his actions are unsteady.

CASE REPORT

The patient, J.H., aged 33, a commercial artist by profession, and an active participant in amateur sport as a hobby, presented himself at the clinic of Oto-Laryngology of the Montreal General Hospital on January 16, 1933. His complaints were: (1) hissing in the left ear; (2) vertigo, with objects moving counter-clockwise; (3) thumping in the head; (4) complete deafness in the left ear; (5) nausea and vomiting; (6) staggering and falling to the left; (7) an unconscious spell coincident with the sudden onset of these complaints.

Family history.—Negative.

Personal history.—This was chiefly interesting from the fact that he was a commercial artist, using in his trade a good deal of opaque lead-bearing paints until three years ago, and to a much lesser degree since that

time. He had followed his present occupation for 15 years. He was an ardent footballer and has been knocked unconscious on several occasions for short intervals while at the game. He had had three attacks of acute abdominal cramps, the first in 1926, the second in 1928, and the third in 1930. It might be noted that this was during the period in which he was using opaque paint which contained a high percentage of lead. He was never careful about washing his hands before eating. He denied venereal disease; no history of any other trouble whatsoever.

Present illness.—The onset was sudden, and came on during a period of uneventful good health while at his work. It started with pain on the top of his head passing down into his ears. This was followed by hissing in both ears and throbbing in his head. That evening, while sitting in his chair at home, he suddenly became very dizzy and then toppled over unconscious. He remained unconscious for about three-quarters of an hour. The next morning he was mentally dazed, and on attempting to rise from his bed fell over again (in the direction of the left). That day the hissing and deafness disappeared from the right ear and settled entirely on the left side. He vomited on several occasions that day and the next. Vertigo was very troublesome, and he felt at times as if he were falling into a hole towards the affected side. This continued for a week, gradually lessening. He tried to work, but dizziness impaired his accuracy, and the headache was increased by the effort. Four weeks after the onset he reported to our clinic after seeking outside medical advice on several occasions.

Physical examination.—He was a rather slim, but well nourished, adult male, looking rather sick and somewhat dazed. A general physical examination revealed the following: blood pressure of 150/80, and the aortic second sound slightly greater than pulmonary second; slight cardiac enlargement to the left. The vessels were thickened sufficiently to be distinctly palpable. Temperature 98° F.; pulse 74.

His gait was normal. The left pupil was slightly larger than the right, with a wider left palpebral fissure; a slightly diminished corneal reflex on the left side. Fine horizontal rotatory nystagmus to both sides was noted. No ocular paresis and no other cranial nerve involvement. Definite spontaneous past-pointing to the right on the left side; slight left-sided adiadochokinesia; slight tendency to walk to the left. No intention tremor. Vibration and position sense normal. Deep reflexes + on both sides. Ab-

* From the Department of Oto-Laryngology, the Montreal General Hospital.

dominals + on both sides. Babinski and Chaddock signs were negative.

Inspection of the nose and throat was negative. The faucial tonsils showed mild chronic infection. There was pyorrhœa alveolaris of mild degree. The ocular fundi were normal. Both ear-drums were intact and normal in appearance. A vibrating tuning fork placed on the vertex was heard only in the right ear. No bone or air conduction for sound existed on the left. Hearing loss for speech as measured by the audiometer was 80 per cent, which represents a total loss on that side. The remaining hearing was only bone conduction to the right ear. Caloric reaction normal on the right and totally absent on the left. Turning test—or stimulation of the vestibular apparatus by turning patient in a swivel chair—right, normal dizziness and nystagmus; left, no response.

Urinalysis, negative. Red blood cells, 5,590,000 per c.mm.; leucocytes, 13,800 per c.mm. Differential count: polymorphonuclears, 74 per cent; lymphocytes, 18 per cent; basket cells, 2 per cent; monocytes, 4 per cent; others, 2 per cent. No stipple cells seen. Spinal fluid clear, under normal pressure; cell count, normal. Pandy, Wassermann and colloidal gold tests were negative. The blood Wassermann test was negative. A renal test meal was negative. Urea and uric acid, normal; creatinine, just above the normal limit. Determination of the lead in the urine showed 0.08 mg. excreted in a 3-days' specimen (upper normal limit, 0.5 mg.).

X-ray findings.—Skull and mastoids negative in all respects. No apical infection of the teeth.

On January 23rd, one week after admission, the functional tests of the ears were again repeated with the following findings: spontaneous nystagmus, drift, and rhombergism gone. Caloric reaction on the left was still absent. Total deafness on the left. Buzzing in the head still present. Also at that time the 5th, 6th, and 7th cranial nerves were normal.

Since January 27th, the date of discharge, the case has been carefully followed and during this period the gradual return to normal continues. The leucocyte count has descended to normal figures. All signs of irritation of the structures superimposed on the petrous angle of the temporal have disappeared. The caloric reaction has again returned to normal on the left side, and is equal to the response in the right ear. The patient is now able to hear sounds when shouted, with the noise box in the right ear. Thus his cranial nerves are again normal, except the cochlear division of the 8th on the left, representing his hearing loss. He is working steadily and with his previous efficiency.

To summarize the case briefly. A young healthy man of 33 years, without any apparent cause is suddenly struck with deafness in one ear; with this is associated tinnitus, nausea, and a period of unconsciousness, later vomiting and staggering gait. On examination the ear drums are healthy, the patient has nystagmus, staggering gait and one-sided adiadochokinesia. He is totally deaf in that ear, and the labyrinth does not respond to caloric or tuning tests. Without any treatment apart from bed-rest and sedatives of a mild nature during the acute stage, all these symptoms gradually disappear during the course of a few months. The only permanent disability that still remains is diminished hearing in that ear, but not the total deafness present when first examined.

We may consider the etiology under the following heads.

(1) Toxic neuritis—as related to (a) lead, (b) foci of infection, (c) kidney hypofunction, (d) diabetes, (e) pernicious anæmia, (f) leukæmia, and (g) acute alcoholism; (2) lues; (3) tumour of the 8th nerve; (4) tumour of the 8th nerve with hæmorrhage; (5) acute exudation into the internal ear as a result of the spread of inflammation from the middle ear; (6) sudden rarefaction of the air in the middle ear, simulating Ménière's disease; (7) labyrinthine hæmorrhage: (a) associated with a hæmorrhagic tendency, or (b) atheroma of vessels and elevations of blood pressure leading to hæmorrhage, or (c) from injury such as a blow with the cuffed hand over the ear, or in fracture of the skull.

Toxic neuritis.—(1) Lead—From the findings of the blood, with the normal red count and the absence of stippling, the negative findings of lead in the urine, the absence of handling lead for the last two years, we may fairly eliminate this factor as a direct cause. (2) As to the presence of a focus of infection, we have not been able to demonstrate such. The white blood count has followed the course of the disease and has returned to normal with the recovery. The possible rôle of this factor, by its nature, cannot be definitely ruled out. (3) This was definitely ruled out by the capable kidney function, as demonstrated by the blood chemistry and the renal test meal. (4) Absence of sugar in the urine and a normal blood sugar content ruled out diabetes. (5) Pernicious anæmia is recognized as a cause of the condition due to an accompanying neuritis. The blood picture eliminates this factor. (6) Leukæmia is also eliminated for the same reason. (7) Alcoholism is eliminated by the fact that the man was an abstainer.

Lues.—The blood Wassermann and the Wassermann and colloidal gold tests on the spinal fluid, together with the negative history, and the fact that he is a married man with a healthy family, are against this as a factor, but do not completely remove it as a possibility.

Tumour of the eighth nerve.—This could hardly hold in the presence of such an acute onset, without any warning signs whatsoever.

Tumour of the eighth nerve with a hæmorrhage into it is a decided possibility and the future will decide this.

Acute exudation into the internal ear as a result of spread from the middle ear. The middle ear was normal. There was no history of any pain or discharge whatsoever. The onset was too sudden. No previous history of middle-ear disease was present.

Rarefaction of the air in the middle ear due to closure of the Eustachian tube, driving the foot plate of the stapes into the oval window as the oxygen is picked up and a partial vacuum develops. This condition may, occasionally, give rise to signs very closely resembling true Ménière's disease, but the following points differentiate it. There is almost always a history of previous deafness or ear disease; the deafness does not occur suddenly, nor is it so profound; inflation of the middle ear by the method of Politzer or the Eustachian catheter relieves it. Bone conduction on that side is not impaired, e.g., the vibrating tuning fork placed on the vertex points to an obstructive deafness and is heard best on the affected side.

Labyrinthine hæmorrhage. — (1) Associated with a hæmorrhagic tendency. The bleeding time was normal and blood picture revealed no dyscrasia. No other evidence of a tendency to bleed was present. (2) Atheroma of the vessels and elevation of the blood pressure acting together to weaken and produce undue strain on

the patient's blood vessels. He had a mild hypertension, 150/80. The superficial vessels were definitely palpable. The cardiac dullness was moderately but definitely increased. The aortic second sound was slightly greater than the pulmonary second sound. He had a history of exposure to lead over some 13 years, with three attacks of abdominal cramps during this period. He was never careful about ingesting lead from his hands, etc. The sclerosing action of the lead on the vascular tree is a long-established fact.

COMMENT

It is extremely difficult to assign a definite cause to a condition which has an etiology with as many possible sources as the one in question, and, as a rule, an approximate estimate of the cause is the best that can be given. Here, then, we are faced with a definite possibility that this was an effect of the action of lead working through its ability as a sclerosing agent on the vascular tree to produce a condition of arteriosclerosis, and then hypertension, resulting in a vascular accident which was a labyrinthine hæmorrhage.

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THE ROLE OF MASTURBATION CONFLICT IN THE DEVELOPMENT OF PSYCHONEUROTIC SYMPTOMS*

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THAT the anxieties, hypochondriacal complaints, depressive feelings, compulsions and fears which characterize the psychoneurotic patient are caused by a conflict between the instinctive tendencies and inner urges of the individual and the social conventions and ideals which he is brought up to believe in is now accepted by the majority of physicians, who have come to realize that certain mental and social factors in the environment of the individual may be just as harmful to his mental health as are pathological factors in the physical environ-

ment to his physical health. Of the mental conflicts that one finds so frequently associated with psychoneurotic symptoms, difficulties in sexual adjustment, and more particularly masturbation problems, appear to play a very important rôle. The following cases illustrate the manner in which such symptoms may develop.

CASE 1

A boy of 14 had been having frequent anxiety attacks for several months. During these attacks he appeared to be very anxious and fearful and did not allow his mother to leave him. He complained of precordial pain and said that his heart was stopping. These attacks came on nearly every night, when he awakened and had a period of typical anxiety which could only be overcome if his mother lay down beside him for the

* Read at a meeting of the Montreal Psychiatric Society, November, 1932.

rest of the night. Occasionally he had one of these attacks at school and had to run home, as he was afraid he would die unless he was near his mother. Physically, his condition was entirely negative. The mother who is an extremely sensitive, over-conscientious type of woman, has been very unhappy in her marital life. The father had always been a crank on health matters. The patient, who is the eldest of three children, had always been a rather shy, sensitive boy and had had considerable difficulty in learning to adapt himself to the usual activities of children. The anxiety attacks in this case seemed to be very definitely related to a masturbation problem. Several months before these attacks began he had had a great deal of conflict over this matter, spoke to his father about it, and received the usual admonitions. He was told that if he continued to practice this habit it would undermine his health. His mother finally took him to her physician, who frightened the boy by telling him that masturbation invariably leads to insanity, loss of manhood, and other serious conditions. The boy then determined never to practise this habit again, and shortly after he developed his first anxiety attack.

CASE 2

Two months before coming for treatment, a boy of 17 who had always been well-adjusted to his home and school developed numerous ideas of reference and misinterpretations. He felt that people on the street were looking at him and passing comments about him. He thought that everybody had turned against him and therefore he decided to stop school and remain at home in order that people might not see him. This boy had been worried over the problem of masturbation for about two years, and had on several occasions made up his mind to stop the habit because he had heard that it would result in his developing a serious illness. He finally decided to see his physician who assumed the same attitude to this problem as did the physician in the previous case. With a great deal of effort this boy was able to overcome this habit, but about a month later he developed the mental symptoms described above.

CASE 3

A boy of 18 had had for six months numerous hypochondriacal complaints, globus hystericus, and especially numerous gastric complaints. He had a series of ceremonials which he must go through before he ate or slept. He must do everything, as he says, "the right way." If he picked up a pen or pencil and commenced to write, he was suddenly overcome by a feeling that he did not grasp the pencil firmly enough. He then had to lay it down on the table and pick it up, as he says, "correctly". Only then was he able to carry on with his work. This compulsion to do things the "correct" or "right" way was carried over into a great many of his daily activities. He had been examined physically by a number of physicians but at no time had there been any physical findings. Again in this case the symptoms developed after a severe masturbation conflict, with a final decision to give up this habit entirely.

CASE 4

A married woman, of 22, had had for two months feelings of depersonalization. She awakened feeling self-conscious. She did not "feel herself." Her surroundings appeared normal, but she felt very small. Her body felt light. After concentrating on a subject she frequently began to wonder who she was and where she was. This woman, who had been married for 4 years, and had had a child who died at the age of 17 months, had experienced considerable difficulty over the question of contraception. Her husband had religious compunctions on this matter, and this resulted in a good deal of marital conflict which created a state of tension in the patient and made her resort to masturbation with accompanying severe conflict. This went on for about

18 months, when she finally determined to give up the habit, and shortly after developed this rather marked psychoneurotic state.

These cases are rather characteristic of a large number of patients in whom the symptoms appear to be definitely related to a severe masturbation conflict, and the symptoms in some patients develop with dramatic suddenness subsequent to the cessation of this practice.

Masturbation *per se* is a normal phase of sexual life and the practice of this habit, if it is not associated with severe conflict, does not produce any ill effects. In fact, the majority of writers on this subject suggest that the practice is a universal one and that its reputed harmful effects have been very grossly exaggerated. K. B. Davis,¹ in a study of certain autoerotic practices in 1,000 married women and a somewhat larger number of unmarried women, finds that 60 per cent practised masturbation. Peck and Well,² in a study of 250 college men, report that 77 per cent admitted this practice. Nearly all writers agree that the so-called effects or sequelæ of masturbation are practically negative. Where, however, there is mental conflict associated with this habit there appear to be more definite effects. Such conflict usually exists in those individuals whose normal sexual curiosity in childhood has been severely repressed because of unwise management on the part of parents, who resort to all sorts of punishments and even castration threats for any such evidence in their children. Those patients who have marked mental conflict associated with masturbation are individuals who have developed a very strict conscience and unusually high ideals, especially where sexual matters are concerned, and this creates a state of tension and conflict which must be resolved in some fashion. The crude, unæsthetic, unromantic individual suffers very little from masturbation conflict. It is usually the sensitive, shy, introverted adolescent who experiences such conflict which frequently leads to the development of symptoms. Since in the practice of this habit the individual resorts to a good deal of phantasy, he develops a tendency to resort to imaginary solutions of any problems with which he has to cope, rather than face the real facts of the external world. Emotional disappointment coming from the outside world to such persons results more readily in neurotic disturbances.

Another factor that leads to the development

of psychoneurotic symptoms in these patients is that the masturbator usually has a strong sense of guilt, with an evident need for punishment for the indulgence in this habit. Karpman³ says that many neurotic symptoms are the punishments anticipated by the unconscious. Anxiety and fear paralyzes the patient physically and mentally. This fear and the appearance of symptoms assure the patient that the criminal act, *i.e.*, giving vent to instinctive cravings, will not be committed. The following case illustrates this mechanism.

CASE 5

For two years a girl of 21 had had numerous hypochondriacal complaints for which no physical cause could be found. Mental examination revealed that she had a great deal of conflict over the problem of masturbation with which she had been concerned for many years. When she was 7 years old she lived through a very trying experience in which a soldier attacked her. This experience she gradually forgot, but throughout childhood she seemed to have a strong feeling of guilt and marked self-consciousness whenever anything pertaining to sex was mentioned. At the age of 10 she began to practise masturbation and continued this habit until about 2 years ago. During this interval she made repeated attempts to stop the practice because she had strong feelings of guilt and began to feel that people might find out about her. She finally determined to stop the habit entirely and her symptoms developed shortly after. The feeling of guilt that pervaded her whole life made itself manifest in many ways especially in the past two years. She had a strong desire to be punished and frequently resorted to a variety of measures which resulted in her receiving some punishment. She frequently would come late to work in order that she might be scolded by her employer, and it was only when she was severely reprimanded or punished in some other way that she felt relieved of the general state of irritability which was associated with her hypochondriacal complaints. She constantly felt that people were too good to her, that they treated her too well, and seemed to long for criticism and punishment.

Where severe conflict associated with masturbation is followed by a complete cessation of the habit it seems that a situation is created in which symptoms can develop more readily. Wechsler⁴ says that anxiety may arise in a person who gives up masturbation because of moral compunctions or fear of hurting himself physically. He says that he has seen such instances following the cessation of masturbation after a confessional or on being deterred from the practice by reading pseudo-scientific literature or receiving foolish advice from a physician or teacher. The suddenness with which psychoneurotic symptoms develop following the cessation of masturbation can be understood when one takes into consideration that where such an energy outlet as masturbation is suddenly completely blocked, especially in an

individual who has no adequate substitute satisfactions, such as opportunities for discharge of energy through physical, social or intellectual activities, a state of tension is created which may readily develop into symptoms. The following case illustrates such a situation.

CASE 6

A young man of 21 developed marked restlessness and insomnia every night for several weeks. He became extremely restless, making convulsive movements with his arms and legs. These became so marked that he had to be tied down to the bed every night for about an hour until the attack subsided. During each of these attacks he was fully conscious, knew what he was doing, spoke to those who were near him, and said that he did not know what made him act in that fashion. After each attack he was able to sleep for the rest of the night and was perfectly well until the following night. Physically, his condition was entirely negative. For several years this patient had had rather excessive sex experiences, which he had carried on continuously to such a marked degree that, on the advice of a physician, he finally determined not to indulge at all. Shortly after he developed the above symptoms which were a definite sexual equivalent.

SUMMARY

Careful study of a large number of such patients leads one to conclude as follows.

1. Masturbation, *per se*, does no definite harm and does not result in psychoneurotic or psychotic symptoms, excepting where it is very excessive.
2. Only when this habit is present in shy, sensitive, introverted individuals, and is accompanied by conflict do such symptoms develop. Conflict is usually the result of attitudes to sex which the adult carries with him from childhood, and these are based on repressive measures, castration threats, and other punishments for sex curiosity in childhood.
3. The use of phantasy in masturbation strengthens the tendency to avoid reality in any difficult situation, and therefore leads more readily to the development of symptoms.
4. The sense of guilt accompanying this practice results in the conception of a need for punishment and the symptoms often act as the punishment.
5. Where there is complete cessation of the habit following conflict a critical situation is created which may very easily result in the development of psychoneurotic symptoms.

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CLINICAL OBSERVATIONS ON KIDNEY STONE CASES*

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NEPHROLITHIASIS is at once the most common and the most destructive of the surgical diseases of the kidney. Furthermore, it is evident, even on cursory consideration, that the treatment of this condition is still far from satisfactory, largely because many patients are seen very late, after infection and extensive destruction of the kidney tissue have occurred. The problem that confronts us therefore is that of making an earlier diagnosis, together with a greater appreciation of the destructive nature of calculous disease of the kidney.

In order to obtain further clinical data, we have reviewed the case histories of the last 100 patients admitted to St. Michael's Hospital suffering from renal calculi. We have nothing original or new to bring before you, but we hope to show by consideration of these clinical data some of the reasons why patients are seen late, and to demonstrate that the removal of stones from the kidney is the most conservative treatment, if patients are seen before extensive renal damage has taken place.

INCIDENCE

The age of the patients in this series varied from 20 to 73 years, with an average of 41 years. More than half were under 40. Although age should not be considered as a deciding factor in the treatment of kidney stone, it is frequently one of the factors which must be considered in such a decision. In a young person, with a history of renal lithiasis of short duration, every effort should be made to remove the calculus by a conservative operation. Such conservatism is even more important in women than in men. Thirty of the 44 women in this group were still within the childbearing age, and therefore subject to the added strain on renal function entailed by pregnancy. In case the patient is older, and particularly if clinical symptoms are of long duration, which to some extent will exclude the possibility of stone formation in the other

kidney, nephrectomy will merit more favourable consideration.

DIAGNOSIS

Contrary to the usual conception, there is no typical syndrome or group of symptoms typical of and generally encountered in calculus disease of the kidney. Definite renal or ureteral colic, so commonly found with ureteral stone, is not usual with stone in the kidney, though many physicians look upon it as typical of this latter condition. In these 100 cases, typical severe renal colic was only encountered twice as a recent or principal complaint. On the other hand, pain in the loin of a less severe character, associated with some degree of pain of ureteral distribution, was found in 42 cases. Thus there were only 44 patients who complained of pain of a renal type with the usual reference along the course of the ureter. Fixed pain in the corresponding kidney area was found in 43 cases. This type of pain was not referred to any other part, but not infrequently was said to "come through to the front." In fact, in 8 patients it was felt principally in the upper quadrant of the abdomen over the tip of the eleventh rib on the corresponding side. The intensity of this fixed pain varied from a definite pain to a dull ache; in 20 cases it was described as a distinct pain and in 23 as a dull ache. In these patients lumbago had been a common diagnosis, while in several patients whose pain was more marked anteriorly, gall-bladder disease was suspected. Although vague gastro-intestinal complaints are not uncommon in kidney stone cases, qualitative food distress is not common, and referred pain to the shoulder or scapular regions never occurs. This type of pain should for the most part be suggestive at least of renal disease and lead to further examination.

Though pain of some sort is by far the most common symptom encountered in these cases, there is no type of pain generally experienced which is typical of stone. Furthermore, in 13 cases no history of pain of any sort could be elicited. The difficulty in diagnosis is in dealing

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with patients who complain only of pain of lesser severity, because with the definite picture of typical renal or ureteral colic so well established it is difficult for many to realize that it is present in so few cases of kidney stone. Therefore, it is emphasized that pain in any way suggestive of renal lithiasis, or associated with any urinary disturbance, warrants further investigation.

Hæmaturia is frequently seen. In this series it was complained of by 36 patients. Doubtless, microscopic evidence of blood in the urine might have been obtained in the vast majority of cases at some time during the course of the disease if an examination had been made at an appropriate time. We found 4 cases in which hæmaturia was the only symptom. In 2, the blood occurred only after exertion. Though not commonly noted, we believe that hæmaturia which is aggravated by exercise should always arouse the suspicion of stone. In any case hæmaturia should be investigated and the cause ascertained. If this is done as a routine, a larger proportion of kidney stones will be diagnosed before great damage has been done.

Frequency, dysuria and pyuria are later symptoms, occurring usually only after infection has taken place. Frequency was noted in 46 patients; this was associated with painful urination in 18. In some instances undoubtedly the frequency is reflex, and only associated with attacks of pain. In one case it was the only symptom. A middle-aged woman was seen recently because of frequent urination. The urine had been negative and the bladder findings were also negative. Consequently, she had been considered to be a neurasthenic until we found on x-ray examination a large shadow in the left kidney area, which was subsequently proved to be a stone in the pelvis of the kidney. The removal of the stone gave her complete relief from her frequency.

Pus in the urine, though only seen grossly by 14 patients, was present on examination in 85 per cent of our cases. When one considers that in cases with infection about stones the destructive processes are more rapid, one realizes the seriousness of this finding. From a diagnostic point of view it is noted that in 2 instances gross pyuria was the only symptom complained of and the one which directed attention to disease in the urinary tract.

The history of having passed a urinary stone

previously, particularly when the recent symptoms are urinary in character, probably is the most convincing factor in a history. Such a history was obtained in 12 of our cases, while 8 patients had had previous operations for renal stone. These will be discussed in more detail when dealing with recurrences.

Physical examination generally does not reveal much information on which to base a diagnosis. A palpable renal mass is not to be expected, except where a large calculous pyonephrosis exists. In our group one such mass, due to a renal neoplasm associated with stone, was found; twelve others were large pyonephroses. Of perhaps greater importance in diagnosis is tenderness in the costo-muscular angle over the affected kidney. Such tenderness was noted in slightly over half of our cases.

From the foregoing discussion it is evident that though the data obtained from history and by physical examination are suggestive of renal disease, and, in the majority of cases, of stone, the final diagnosis can seldom, if ever, be made by these means alone. The actual demonstration of stone must be made by x-ray, frequently supplemented by cystoscopy or intravenous urography. In 98 per cent of these cases a suggestive shadow was shown by x-ray examination of the urinary tract. In one of the remaining cases, pyelography showed a negative shadow cast by a non-opaque stone. In the other one, the stone was demonstrated at post-mortem after death from other causes. No x-ray examination was made in this case.

The delay in diagnosis therefore is largely due to the fact that frank renal colic is still considered as the typical symptom of kidney stone. We have demonstrated that this is unusual and that even milder degrees of renal pain with ureteral distribution are encountered in less than half of the cases. It is only when patients complaining of less typical pain, hæmaturia, pyuria, and other urinary symptoms are subjected to careful urological examination, which should invariably include thorough x-ray examination of the urinary tract, that the early diagnosis of kidney stone will be accomplished.

TREATMENT AND RESULTS

The 100 cases under consideration include all cases admitted to hospital with stone. In a considerable number the immediate cause for entering hospital was some other serious condi-

tion. Several refused treatment and some were definitely inoperable when admitted. Surgical treatment was applied in 58 cases. Nephrectomy was found necessary in 22, or 38 per cent, of these cases, due in most instances to marked diffuse infection or pyonephrosis. The stones in the kidneys were commonly described as multiple and scattered in the calyces or in areas of necrosis. Included in this series are 8 cases in which the kidney had been operated on for stone elsewhere, and 3 in which a previous operation had been done at St. Michael's Hospital.

In the presence of multiple-branched or large stones, hydronephrosis, or extensive areas of renal infection, the question frequently arises as to whether a conservative operation or nephrectomy should be preferred. As one of us has already pointed out, the indications for nephrectomy are: (1) when the kidney is functionless or nearly so; (2) the presence of secondary malignancy; (3) diffuse advanced infection; (4) the presence of marked hydronephrosis; and (5) when there has been a previous operation on the kidney.

Though conservative operations are more desirable, it was only found possible to remove the stone by this type of operation in 62 per cent of the cases operated upon. In these, the stone was removed through the pelvis of the kidney in 29 instances and by nephrolithotomy in seven. It is of interest to compare the duration of symptoms in these cases with that of those in which a nephrectomy was done. In the former the symptoms had existed for 3.5 years, while in the nephrectomized patients it was found that they were of 6.5 years' duration. This emphasizes the fact already discussed that neglect of symptoms with late diagnosis allows time for more extensive kidney changes, which eventually necessitate nephrectomy.

The frequency of recurrence of stone after operation is difficult to estimate. In this group of patients there were 11 recurrences in 10 patients. This compares favourably with most reported series. In eight instances the patients had been operated upon elsewhere for removal of stone and consulted us because of recurrence,

while in three instances recurrence is definitely known to have occurred after operation in St. Michael's Hospital. Though other recurrences may have occurred in our cases, doubtless the inclusion of cases previously operated upon elsewhere gives a fair estimate of its frequency. The distribution of these cases of recurrence according to the operation performed is seen in the following table.

RECURRENCE OF THE OPERATION FOR KIDNEY STONE

After pelvio-lithotomy in same kidney	6
After pelvio-lithotomy in opposite kidney	1
After nephrolithotomy in same kidney	3
After nephrectomy	1

The percentage of recurrence after conservative operation is therefore about 10 per cent. Some of these at least may not be true recurrences, but rather due to stones or particles of stone left behind at the previous operation. The low percentage of recurrence in the remaining kidney after nephrectomy appears to indicate the presence in many instances of an anatomical factor in stone formation in the affected kidney.

There were four post-operative deaths; one from acute infection after pelvio-lithotomy; one from broncho-pneumonia and sepsis after drainage of a huge perinephric abscess and removal of a large calculus which had caused the abscess; one from calculus anuria, where a stone had blocked the uretero-pelvic junction for seventy-two hours in an only kidney; and one after operation for recurrent stone in an infected kidney in a diabetic patient.

CONCLUSIONS

1. Lithiasis is the most common and destructive surgical disease of the kidney.
2. Diagnosis is often delayed because stone is unsuspected in the absence of renal colic.
3. In all cases symptoms and signs are present warranting investigation of the urinary tract.
4. X-ray examination will reveal a shadow in almost every case of renal stone.
5. Earlier diagnosis and earlier operation will result in a large percentage of conservative operations.

A METHOD OF REDUCING SUPRACONDYLAR FRACTURES OF THE HUMERUS*

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SUPRACONDYLAR fracture of the humerus is one of the most common types of fracture with which the profession has to deal. In a large series of cases reported by Coker,¹ of Georgia, approximately 14 per cent belonged to this group. It is most common in children. This is explained by Magnusson² as being due to the fact that the supracondylar part of the humerus is thin and weak. However, as adults meeting with the same kind of an accident receive a Colles' fracture, and as the strength of the humerus and radius is relatively the same in childhood and adult life, there must be some other explanation. Two anatomical factors suggest themselves. In the first place, the lower end of the radius, in both childhood and adult life, is supported by tendons only, no muscles coming in contact with this section of the radius; the lower end of the humerus, on the other hand, is supported behind by the triceps, relatively thin and weak in a child, but in an adult developed into a heavy, powerful muscle. Hence; the relative support of these two areas in an adult would appear to be very much greater in the lower end of the humerus, and as a result the response to the fracturing force is a supracondylar fracture in a child and a Colles' fracture in an adult. The second factor has to do with the direction of the lower end of the humerus. In childhood this part has relatively less forward curve, and with the arm in extension receives the force in a position that gives greater leverage.

Supracondylar fractures have always been difficult to reduce. Complete anatomical reduction has not been the rule, some deformity resulting in limitation of motion or loss of the carrying angle. Further, nerve and vessel involvement have resulted in serious complications, and open operation has been too common. The fact that many methods of reduction have been described indicates that an entirely satisfactory method has not been evolved.

Development.—At birth, the shaft of the humerus is completely ossified, while the lower end remains cartilaginous. At two years a centre of ossification appears in the capitellum, gradually extending inward; at five a centre appears in the internal condyle, and at twelve years in the inner end of the trochlea; at thirteen years a centre appears in the external condyle. Of the seven, or at times eight, centres from which the entire humerus ossifies four are grouped around the lower end. These centres gradually enlarge, the outer three finally coalescing to form one mass, which unites with the shaft about the sixteenth or seventeenth year. The inner condyle, ossifying from a single centre, unites with the shaft at the eighteenth year. In studying a roentgenogram of the lower end of the humerus, one should be familiar with the above centres, when and where they appear, and when ossification is complete.

Anatomy.—Anatomically, the elbow joint is a ginglymus or hinge-joint, but this is complicated by the fact that the head of the radius, articulating with the capitellum, permits of rotation as well as flexion and extension. The joint is formed by the humerus above articulating with the ulna and radius below, the main part of the joint consisting of the large upper end of the ulna (the greater sigmoid cavity and the trochlea of the humerus).

The capsule entirely surrounds and encloses the joint and is thickened at each side to form the internal and external lateral ligaments. These are powerful bands of fascia and with the forearm in extension do not permit of any lateral motion. The capsular tissues in front and behind the joint are somewhat thickened, and are known as the anterior and posterior ligaments.

The muscles in relation with the joint which are of practical importance in considering supracondylar fractures are the brachialis in front, the triceps and anconeus behind. The biceps, while not in direct relationship with the joint, exerts an upward pull and is a factor in dis-

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placement of the lower fragments. The most important muscle in this group, both in causing displacement and in retaining the fragments in position after reduction, is the triceps. The brachial artery, median nerve, and musculospiral nerve are in front of the joint, while the ulnar nerve is behind and directly in contact with the internal condyle. These structures may be and frequently are injured by fractures in this field. It is important to bear in mind that hyperflexion of the forearm, the position of choice in treating supracondylar fractures, may be carried to the point of interfering with the circulation and cause trophic changes in the tissues of the extremity.

Cause and mechanism.—As already stated, fractures around the elbow joint are much more common in children than adults and the supracondylar is the most common type. The usual cause is a fall on the outstretched hand. The force being transmitted along the radius drives the lower end of the humerus backward and upward. If the lower fragment is displaced completely behind the posterior border of the upper fragment the triceps increases the deformity by exerting an extra upward displacing force. Because of the direction of the fracturing force, the line of fracture is usually from before backward and upward. The force being largely transmitted along the radius is accordingly applied towards the outer part of the articular surface of the humerus and displaces the lower fragment outward. The backward, outward, and upward displacement of the lower fragment destroys the carrying angle, makes a fullness in front of the joint, and is responsible for the typical deformity found in these cases.

Significant points. — In reducing supracondylar fractures of the humerus there are several points which should be constantly kept in mind.

1. Reduction should be undertaken as early as possible. The swelling which is usually quite marked subsides more easily and rapidly after the fragments are replaced.

2. Before an attempt is made at reduction, and before any anæsthetic is given, a careful examination should be made to detect any nerve or vessel injury. Wrist-drop or an ulnar paralysis can be very easily overlooked.

3. The carrying angle should be maintained. In order to appreciate the relation of the forearm to the upper one should remember that the

lower articulating surface of the humerus is not at a right angle to the shaft, but is directed outward, downward and forward. In flexing the forearm during reduction, it must be carried through an arc that will correspond to the plane as established by the articular surface.

4. Hyperflexion is to-day generally recognized as the position of choice, as it holds the fragments, once they are reduced. The upper ends of the bones of the forearm with their processes, together with the ligaments, fascia and muscles, form a basket arrangement that holds the fragments securely in place.

5. An anæsthetic is essential in reducing this fracture.

METHOD OF REDUCTION

The method described in this paper has been used for several years and about twenty-five cases have been treated with good results. It is very similar to the classical method of reducing a Colles' fracture. It utilizes two principles, the fulcrum and hyperextension. Both thumbs of the operator form the fulcrum while hyperextension is employed by an assistant who handles the forearm. As there is usually less swelling over the posterior aspect of the arm than at any other point, the fragments can more easily be palpated in this area. In order, the steps are as follows.

- (1) The arm is grasped by the operator with both hands, the thumbs being placed vertically on the posterior surface at the line of fracture.
- (2) The forearm under moderate extension is hyperextended by the assistant over the thumbs of the operator, at the same time being moderately abducted.
- (3) The operator gradually works the lower fragments down until the fracture lines approximate as nearly as possible.
- (4) The assistant then, increasing the extension, flexes the forearm, carrying it through an arc of a circle that brings it well inside the shoulder, the operator in the meantime retaining the alignment with his thumbs.
- (5) The radial artery is palpated to ascertain the presence of a pulse.
- (6) A small piece of cotton is placed in the angle of the elbow and adhesive straps brought around the arm and forearm to hold a hyperflexed position.
- (7) An x-ray is taken immediately after reduction.
- (8) If the fracture is found to be satisfactorily reduced the arm is held in a sling and the hand fastened to a collar around the neck.

At the end of two weeks the straps are cut and a little passive motion started. Radiant heat and gentle massage are advised at this time, to improve the circulation. The straps are re-applied for another week. At the end of three weeks the dressing is removed and the child encouraged to move the arm voluntarily. When

not exercising under supervision the hand is fastened to the collar. At the end of the fourth week weights may be carried and more vigorous methods adopted to secure extension of the forearm.

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A PROBLEM IN THE DIAGNOSIS OF RENAL DISEASE*

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The development of the various tests of renal function has enabled us to understand more fully the actual condition of the kidneys in particular cases, but in order to arrive at a complete understanding of the condition these tests must also be taken in conjunction with the history and physical and laboratory findings. Yet in spite of all these aids we occasionally meet a case where the closer investigation, the farther is one led astray from the actual diagnosis. The following history is considered worthy of presentation as an illustration of this type.

The patient was a male, 63 years of age, a fireman by occupation, who entered the Royal Victoria Hospital on October 31, 1932, with numerous complaints. For the past five years he had suffered from occasional attacks of dizziness. Three years before admission urinary symptoms had developed, consisting of a night frequency (nine times), with small amounts of pale urine. The frequency was also present in the day, but not so markedly. If urination were delayed after the onset of the desire to void there was a sharp suprapubic pain and a desire to continue after the stream had ceased. No blood had ever been observed in the urine. During this time he had become short of breath on exertion, and found it neces-

sary to use two pillows at night. On several occasions he had noticed some swelling about his eyes, apparently not related to any particular time of the day. Frontal headache, formerly mild, had recently become more severe, and in the week preceding admission nausea, vomiting and diarrhoea (the latter up to 15 movements daily) first appeared. A symptom of some duration also was a severe pain in the lumbar region, which was made worse by stooping.

The only history obtained of previous illness was that he had suffered from measles and scarlet fever at the age of 8, and from malaria in 1900. The family history was negative.

On physical examination the patient appeared moderately orthopnoëic and somewhat pale; there was a slight degree of œdema over the sacrum, but none elsewhere. The radial vessels were moderately thickened and tortuous, and a well marked arcus senilis was present. Except for some contraction of the arteries the fundi showed nothing abnormal in their appearance; the blood pressure was 140 systolic and 70 diastolic. Moist râles were heard over the left lung base posteriorly, and the liver was palpable 4 cm. below the costal margin. By rectal examination the prostate was found to be moderately enlarged and possibly slightly nodular. There was also some costo-lumbar tenderness on both sides.

A single specimen of urine was acid in reaction, with a specific gravity of 1010; there was a large amount of albumin, and no sugar; rare granular casts and a few red blood cells were found microscopically. With the modified two-hour test the specific gravity of the various day specimens ranged from 1009 to 1013, the night volume was 540 c.c., and the specific gravity 1009.

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The non-protein nitrogen of the blood was 134 mg. per 100 c.c.; the creatinine 5.4 mg. per 100 c.c. The red blood cells numbered 3,300,000; hæmoglobin was 70 per cent, and leucocytes, 10,000.

With this history and the various findings it was evident that we were dealing with an advanced condition of renal failure, confirmed by the marked inability of the kidney to concentrate the urine, and the extreme retention of nitrogen products in the blood. There was, of course, a moderate degree of associated circulatory failure.

The first symptoms of dizziness, five years before, suggests a vascular basis, and the œdema of the face, a true nephritis; when these are combined with the marked nocturnal frequency, we are led to consider a nephritis with vascular disease, the so-called contracted kidney. However, the other urinary symptoms, broadly to be classed as dysuria, would point to a local lesion in the bladder, such as might be produced by prostatism or vesical calculus. The pain in the back does not appear to fit into the picture. The absence of hypertension or changes in the retina is against a contracted kidney, while the finding of prostatic enlargement is a point in favour of a surgical condition; on the other hand, the presence of casts and red blood cells is more reconcilable with nephritis than with surgical obstruction alone.

At this point the aid of the urologists was sought, when additional discoveries of significance were made. The urinalysis this time failed to show casts, and more red blood cells were present. A phenolsulphonaphthalein test gave a yield of 5 per cent in two hours, confirming the previous data, showing a markedly depressed renal function. The prostate was considered moderately enlarged and not the seat of malignancy; its enlargement did not interfere with the passage of the cystoscope, by which the bladder was seen to be normal, except for a moderate intravesical enlargement of the prostate. Both ureteral orifices appeared normal, and were not catheterized. A cystogram was normal, but the x-ray appearance suggested Paget's disease of the pelvic bones. The shadow of a calculus was seen in the region of the lower pole of the left kidney. Further skiagrams gave the appearance of metastatic carcinoma in the pelvis and lumbar vertebræ, and an irregularity in the right

diaphragm was suggestive of a metastasis in the liver. Accordingly, it was decided to catheterize the ureters and explore the upper urinary tract. On the right it was found impossible to pass the catheter up the ureter, apparently due to stricture. On the left it was easily done, the subsequent pyelogram showing a double ureter and renal pelvis. The picture, however, was that of either an extreme congenital anomaly of the upper pelvis or else a new growth involving this region; a calculus was present in the lower pelvis. Thanks to the cystoscopic aid the diagnosis now appeared to be stricture of the ureter (right), neoplasm of the upper pelvis (left), and calculus of the lower pelvis (left), with renal insufficiency and uræmia and metastases in the bones.

The subsequent progress of the patient was rapidly downhill, with increasing nitrogen retention. On November 26th he developed a pericardial friction, and died the following day. At no time was there any hypertension, and the urine volume ranged from 1,000 to 2,000 c.c. daily.

Autopsy findings confirmed the condition of double ureter and pelvis on the left, with a calculus in the lower pelvis; there was, however, no neoplasm, merely a small upper pelvis. The right ureter was constricted near the orifice, but a probe could be passed through it, though with some difficulty. Both kidneys, however, presented the typical appearance of secondary contraction, while there was an exudative cystitis. The changes in the bones found by x-ray were apparently due to proliferative osteoarthritis; no evidence of malignancy could be found.

In retrospect it would appear that the history of dizziness, suggesting vascular changes antedating the history, with findings of marked renal insufficiency, should have suggested a renal failure associated with vascular disease—the contracted kidney. There was nothing in the history to take as the etiological factor, unless one blames the scarlet fever 55 years before. The recurrent œdema of the face is best explained as the "nephritic" type, probably due to exacerbations of the underlying nephritic process. The presence of casts in the urine is again suggestive of a nephritis, though they might have been produced by the circulatory failure present at the time of observation. On the other hand the subjective urinary symptoms

are more typical of a surgical condition in the bladder, to which the renal failure could be secondary, and the absence of hypertension and changes in the fundus might appear to support this idea, unless we remember that statistics show that they may be absent in about 40 per cent of cases of secondary contracted kidney.

With cystoscopy eliminating the prostate as a mechanical factor the diagnosis of nephritis might again have prevailed, had not the x-ray suggested malignancy of the bones, making a further search for the original growth advisable. The coincidence of a double renal pelvis with an unusual outline proved too great a temptation, and malignancy of the kidney was diagnosed.

The terminal pericarditis is much more usual in a medical nephritis and should have served to bring up again the question of this diagnosis. However, the evidence of the more intricate investigations outweighed that of the simpler clinical observations, with the result that false conclusions were drawn and a diagnosis entertained which would not even have been suspected had less intensive investigation been made.

SUPERFICIAL ABDOMINAL GANGRENE AS A COMPLICATION OF VARICELLA

BY T. R. NICHOLS,

Stratford, Ont.

This case appears to be of rather unusual character and therefore worth recording.

A previously healthy girl, aged 11, on July 22, 1933, developed a scattered vesicular eruption on her body, apparently the result of contact with cases of chicken-pox at her home two weeks previously. During the next two days, she became very acutely ill, with high irregular temperature, and the chiropractor in attendance finally advised medical attention.

When seen on July 25th, the patient's condition was as follows: temperature 102°; pulse 100; respirations 22. She complained of very severe pain in the lower abdomen, was very restless, and refused food. A moderate number of drying vesicles were present on her body. In the mid-line of the abdomen, and about two inches below the umbilicus, was a vesicle which had become infected, a small amount of pus being present underneath the scab. Extending

laterally on each side, and forming a horse-shoe-shaped area about 2 by 6 inches, was a purplish mottled area, slightly indurated, and extremely tender to the slightest touch. Boracic compresses were applied to the infected vesicle, and dry heat to the abdomen. The patient complained bitterly of pain caused by the treatment, in spite of the free use of codein by mouth.

In the evening of July 25th, she appeared to be critically ill: temperature 100.6°; respirations 26; pulse 140. The affected area on abdomen had become darker in colour and had extended slightly. Radical treatment was decided upon, the affected area being extensively excised down to the fascia, which appeared unaffected. The fatty tissues of the necrotic area were of a dull grey colour; and very little bleeding occurred. No pus was present, except for one drop immediately below the infected vesicle. The wound was lightly packed with gauze, and irrigation tubes inserted, no attempt at closure being made. Staphylococci were found in a smear of the pus, and the white blood cell count was 56,000.

The patient was irrational and extremely restless during the night, not being controlled by the use of morphine. Her condition rapidly became worse and she died the following morning. At that time the area of gangrene was found to have extended considerably during the night.

AN UNUSUAL DEATH IN A CASE OF BRAIN TUMOUR

BY H. H. HEPBURN,

Edmonton

The patient, L.L., a well developed, robust male, first became aware of headaches about the middle of December, 1932. His mother had noticed that all his movements, and his mental faculties had slowed up progressively since September, 1932. By the middle of December his memory had become very defective. His cerebration was slow, and he slept a great deal. On December 25th, he had what he described as a splitting headache all day. He vomited two or three times. On December 27th, he consulted an optician and was given a pair of glasses which failed to relieve his headaches.

On January 20, 1933, he consulted Dr. C. V.

Jamieson, ophthalmologist, who found bilateral papilloedema, and suspected the presence of a brain tumour.

He was admitted to the University of Alberta Hospital on January 21, 1933, (No. 9720). The clinical findings pointed to brain tumour, posteriorly located, causing acute, internal hydrocephalus.

On January 27th, we proposed to perform bilateral ventricular puncture for the purpose of ventriculography. After three days of comparative comfort, his headache had become more severe that morning, and he had again vomited. At 9 a.m. he was given a hypodermic injection of morphia, gr. 1/6, with hyoscine hydrobromide, gr. 1/150. At 9.30 a.m. he was taken to the operating room, placed in the operating chair in a sitting posture, inclined slightly backwards, with a suboccipital support. He was drowsy, but conscious and able to converse. His colour was good, and the respirations were normal.

After local injection of novocaine solution, 1 per cent, the scalp was incised, and the skull perforated by the Hudson drill at a point 6 cm. above the external occipital protuberance, and 4 cm. lateral to the midline on each side. The dura mater was opened on the left side and an Adson ventricular cannula inserted. The left lateral ventricle was punctured without difficulty, at a depth of 5 cm. from the surface of the skull. When the stilette was withdrawn, clear cerebro-spinal fluid spurted out under great pressure. The stilette was quickly re-inserted. The dura mater was then opened on the right side and a second cannula was inserted. When the stilette was withdrawn from this cannula at a depth of 5 cm. no fluid was obtained. At a depth of 6 cm. only a few drops of blood-stained fluid escaped. The stilette was then partly withdrawn from the left cannula and the fluid allowed to escape slowly. Only 25 c.c. of fluid in all were obtained, and this was slightly blood-stained. Lateral and backward tilting failed to bring any more fluid. At this point it was noticed that the patient was becoming slightly cyanosed, and his respirations somewhat stertorous. He failed to respond to questions, although he had been engaged in conversation a couple of minutes before. No air was injected. The cannulae were removed and the patient placed on a table. He never

regained consciousness. Voluntary respiration ceased at 10.30 a.m. and was never resumed.

Artificial respiration soon restored good colour. The pulse was 90 and of good volume. Spinal puncture in the third lumbar space showed a slightly blood-stained fluid. Time was not taken to register the pressure, but it did not appear to be elevated. Five c.c. of fluid were removed. Artificial respiration was resumed, and oxygen was administered through a nasal tube until 11.15 a.m. At that time the mask of a gas-oxygen apparatus was fitted to his face, and intermittent pulmonary inflation was carried out by Dr. J. A. Blezard, using oxygen with 20 per cent carbon dioxide. Later, a tube was introduced into the trachea.

At 2 p.m. the pulse was 100 per minute and quite regular; the blood pressure, 82/60. The cheeks and ears were pink. The skin was warm and moist. There was no undue perspiration. There was no voluntary effort at respiration. His condition continued much the same throughout the day.

At 4 p.m. the rectal temperature was 99°; pulse 100, regular; blood pressure 94/70; colour good.

Pure carbon-dioxide, and various mixtures with oxygen were tried. Ether was added at times. All pulmonary inflation was completely stopped on several occasions. Bilateral jugular compression was tried. Nothing would produce deep cyanosis. The results obtained were very slight cyanosis, irregularity of the pulse, with acceleration of rate and fall in pressure. On two occasions the valve on the mask was closed to prevent all possible entry of air or oxygen for periods of ten minutes. The pulse became so weak and irregular that it was believed that he could not survive more than eleven or twelve minutes of this. During the second test the pulse rate rose to 140. There was a livid colour to the entire body, but no deep cyanosis. Healthy colour was promptly restored by oxygen insufflation. The pulse was 82, after ten minutes. For about twenty minutes the pulse continued to drop every fourth beat at the wrist.

At 5 p.m. the pupils were inactive and almost completely dilated. All cutaneous reflexes were absent. The anal sphincter was relaxed. Knee-jerks and ankle-jerks could not be elicited. There was no clonus. There was a constant vermiform movement of the scrotum. The only

tendon jerk elicited was that of the biceps in the left arm. Percussion of the extensor muscles of both forearms gave prompt but somewhat reduced extensor reflex. Both upper and lower limbs were flaccid, resembling those of a patient under deep general anaesthesia. Capillary reaction to pressure and to scratching was normally prompt.

One should record that the advisability of cerebellar decompression had been considered earlier in the day. The relatives, wisely, as events proved, declined to consent to this, but volunteered permission for an autopsy.

At 5.45 p.m., with the assistance of Dr. R. Proctor, galvanic and surging sinusoidal stimulation was carried out. With the positive electrode applied to the suboccipital region and the negative over the forehead, and later over the epigastrium, using 40 milliamperes of a direct current, the muscles of the neck, thorax, and shoulders could be made to contract briskly. There was no effort at voluntary respiration.

At 6.30 p.m. the rectal temperature was 99°; pulse 90. The blood count showed red blood cells, 5,210,000; white blood cells, 20,800; hæmoglobin 120 per cent; polymorphonuclears, 82; lymphocytes, 14; monocytes, 4; eosinophiles, 0; basophiles, 0. Involuntary urination occurred about that time. Shortly after this the pulse failed considerably, but reacted promptly to 7 minims of adrenalin solution injected into the muscle of the left ventricle of the heart.

At 7.30 p.m. the pulse again weakened, and there was little reaction to 7 minims of adrenalin solution injected into the heart.

At 8.10 p.m. there was no visible, or palpable pulsation. The heart sounds ceased to be audible. The patient was pronounced dead, nine hours and forty minutes after the last voluntary respiration.

During the day he had been given intravenously 500 c.c. of 6 per cent gum acacia solution, and 500 c.c. of normal saline. On two occasions he was given intravenously 2 c.c. of coramine. Subcutaneously he was given 1 c.c. of pituitrin, 7½ grains of caffeine benzoate, 10 minims of adrenalin on two occasions. On two occasions he was given 7 minims of adrenalin solution, 1/1,000, into the heart muscle.

An autopsy performed by Dr. J. W. Macgregor at 10 p.m. showed a soft, well-circumscribed, hæmorrhagic tumour mass, measuring 7 by 5 by 2 cm., situated in the white matter of the posterior portion of the left cerebrum. The tumour pushed into the posterior horn of the left lateral ventricle, and could be lifted out easily, except in the region of the splenium of the corpus callosum, where it was adherent and seemed to be extending across to the other side. Sections were examined and the tumour was later classified as a spongioblastoma multiforme.

The whole of the pons and upper part of the medulla was œdematous. It is assumed that the release of pressure by ventricular puncture was followed by sudden œdema of the pons and medulla, resulting in respiratory failure. It is interesting that the heart action continued for nine hours and forty minutes after the sudden cessation of respiration.

THE FRIEDMAN PREGNANCY TEST.—P. M. F. Bishop (*Guy's Hosp. Rep.*, July, 1933, p. 308) refers to the fact that the biological tests for pregnancy provide a means of diagnosis as early as a month after conception, and he comments on the importance of these tests in differential diagnosis. Those hitherto employed are the Aschheim-Zondek, the Siddall, the œstrin test of Mazer and Hoffman, and the Friedman test. This last test, in which rabbits are employed, depends upon the fact that in these animals the urine of human pregnancy produces corpora hæmorrhagica within twenty-four hours, owing to the presence of prolactin B. It is therefore more practical and gives a result more rapidly than the original Aschheim-Zondek test. The author has elaborated a technique for the Friedman test which, by excluding the main source of error, has so far given no

incorrect result. Experimental investigations in connection with the test showed that the active principle in the urine remains potent for at least six days after the urine has been voided, and that a positive reaction is obtained as early as twenty-one days after conception. The test becomes negative within forty-eight hours after parturition. It was found that whereas mechanical stimulation of the cervix uteri in a rabbit tends to produce fresh corpora lutea, the injection of urine of pregnancy almost invariably produces corpora hæmorrhagica. In patients with pituitary disorder the urine might contain an excess of prolactin, while in chorion-epithelioma the equivalent of 1 in 300 c.c.m. of urine might give a positive reaction. If a pregnant rabbit was used as the test object, the result could be relied upon if positive, but if it was negative the test should be repeated.—Abs. in *Brit. M. J.*

Clinical and Laboratory Notes

A MODIFICATION OF THE CLAVICULAR CROSS

BY E. K. CUNNINGHAM,

Carman, Man.

The clavicular cross is a common means of treating fractures of the clavicle. I have treated a number of such cases with the usual cross made from light wood, well padded. This maintains the shoulder in good position, but is difficult to keep in adjustment (in round-shouldered people especially). The patients find it somewhat bulky and awkward to wear under their ordinary clothes (women in particular). The adjustable metal cross is satisfactory, but it is bulky and also expensive, which is an item to be considered, if, as recently occurred in our experience, a patient leaves the hospital wearing the splint and fails to return it.

Recently I have tried making clavicular crosses of moulded plaster, taking the idea from the posterior plaster shell used in spinal cases. They are made as follows. The patient is placed face down upon the table with a small firm pillow or sandbag under each shoulder. The back is covered with a layer of sheet wadding. The plaster is moulded over the back and shoulders in the shape of a cross, but covering a larger area than the finished splint (otherwise the splint will be thin at the edges). Just before the final few layers are put on, three ties, made from factory cotton bandages, are incorporated in the plaster. A transverse and vertical "rib" is added to strengthen the splint. When the plaster is set firm enough to handle the size of the cross is scratched in the plaster. The cross is then removed and

trimmed. It is allowed to harden for 24 hours and is not applied until thoroughly hard and dry. In the meantime, the patient is kept flat on his back in bed with a pillow between the shoulders. The shoulder can be fixed temporarily with a Velpeau or Sayre bandage. When dry, the edge of the cross is bound with adhesive tape. The front is padded with sheet wadding and covered with stockinette. The ties are padded with absorbent cotton which is



kept in place by a spiral gauze bandage.

The advantages of the moulded plaster cross are: (1) it is form-fitting and easily worn under everyday clothes; (2) it is comfortable to wear and lie upon; (3) it maintains the shoulder in good position; (4) it is easily made by anyone accustomed to handling plaster; (5) it is strong enough, if carefully made; (6) the patient does not have to return the splint.

UNDULANT FEVER IMITATING PULMONARY TUBERCULOSIS.—A. Fröik (*Ugeskrift for Læger*, August 17, 1933, p. 879) gives details of fifteen patients suspected of suffering from pulmonary tuberculosis, having in several cases been sent to a sanatorium, yet found on further examination to be suffering from undulant fever. In thirteen of these cases there could be no doubt as to the accuracy of this diagnosis. Considering how closely the clinical picture tallied with that of a typical case of early pulmonary tuberculosis, these mistaken diagnoses were most natural. Many of the patients suffered from lassitude and anorexia, but it was noteworthy that their general state of nutrition was hardly impaired in spite of the disease having lasted a considerable time. Only one of the patients presented a phthisical appearance with pallor. All the cases were febrile, and the onset of the disease had seemed to

indicate a cold or influenza. The undulant character of the fever had been overlooked because the temperature had not been taken regularly, frequently, and over a considerable period; had it been taken systematically for a fortnight and the findings recorded on a temperature chart instead of being merely noted in figures the specific character of the fever would have leapt to the eye. In one case there was a history of blood-stained sputum, and in four cases slight changes in the chest were demonstrable by the stethoscope. These transitory chest findings were doubtless incidental to the general blood infection. The skiagrams of the lungs were the most valuable means of correcting the original mistakes; in ten cases the x-ray findings were negative, and in three cases they showed only enlargement of the hilus glands—an enlargement due either to the undulant fever itself or to the tuberculosis of these glands—Abs. in *Brit. M. J.*

Editorial

POISONING WITH DERIVATIVES OF BARBITURIC ACID

SINCE the introduction of veronal (barbitone; barbital) in 1903 drugs of the barbituric acid series have met with a steadily increasing popularity. No doubt this is due to the fact that in medicinal doses they seem to exert their action exclusively on the central nervous system, and therefore have come to be regarded as ideal sedatives and hypnotics. Their popularity, moreover, is not confined to the medical profession but is manifested among the laity as well; hence a considerable element of danger. On consulting the literature one is struck with the surprising number of cases of poisoning with members of this group, not a few of them fatal. As a rule the drugs have been taken accidentally or with suicidal intent, but it is worthy of note that a fatal result has followed the ingestion of what is ordinarily regarded as a safe therapeutic dose. In such cases we must assume the existence of a special idiosyncrasy. Consequently, great circumspection should be exercised at all times in the use of the barbiturates, particularly when they are employed as basal drugs in anæsthesia, and their sale to the general public, except on prescription, should be prohibited. At the present time veronal and luminal can be purchased by anyone over the counter.

The chemists, with their customary assiduity, have detached from and attached to the original barbituric acid radicle so many side-chains that, we understand, there are now in existence some two hundred lineal descendents of the parent stock. Several of these are on the market under various trade names, some under more than one. Among the better known are the following:—allonal (allyl-isopropyl-barbituric acid plus amidopyrine), amytal (isoamyl-ethyl-barbituric acid), dial (diallyl-barbituric acid), evipan (sodium *c-c*-cyclohexenyl-methyl-*N*-methyl barbiturate), ipral (calcium ethyl-isopropyl-barbiturate) luminal (gardenal; phenyl-ethyl-barbituric acid), medinal (veronal-sodium; monosodium salt of diethyl-barbituric acid), nembutal (sodium ethyl-methyl-butyl-barbiturate), numal (allyl-isopropyl-barbituric

acid), pernocton (butyl-brom-allyl-barbituric acid), proponal (dipropyl-malonyl-barbituric acid), somnifen (diethyl-diallyl-barbiturate of diethylamine), soneryl (butyl-ethyl-barbituric acid), veramon (diethyl-malonyl barbituric acid), and veronal (diethyl-barbituric acid). These all act in the same general fashion. In suitable doses they induce natural sleep, often without subsequent depression. With poisonous doses we get nausea, mental confusion, muscular weakness and incoordination, passing on, in the severer cases, into stupor, cyanosis, coldness of the skin, coma, and death from respiratory failure. Pneumonia is a common feature in the late stages. The full toxic effects take several hours, or even two or three days, to manifest themselves. Owing to the widespread use of veronal chronic poisoning with this drug is not uncommon, and it may occur after the exhibition of therapeutic doses repeated at short intervals, as elimination is slow and the action cumulative. Mental and bodily weakness, tremors, and giddiness have been noted, and, in the case of luminal, gastric disturbance, vertigo, diplopia, and disorders of speech. Skin rashes of various kinds are a common feature after the administration of the barbiturates.

The size of the poisonous dose is not definitely fixed, depending, of course, on the preparation used and the vulnerability of the recipient. Cushny¹ puts the average minimal fatal dose of veronal at 50 grains. Much less than this, however, has caused death; one fatal case of poisoning is recorded from the ingestion of 15 grains, and one from as small an amount as 10 grains. On the other hand, after appropriate and vigorous treatment, recovery has taken place when almost incredibly large amounts had been taken — several after 125 grains and one, at least, after 135 grains. Bertrand-Fontaine and Claas² record recovery

1. CUSHNY, A. R., *Pharmacology and Therapeutics*, ninth ed., Lea & Febiger, Phila., 1928, p. 252.
2. BERTRAND-FONTAINE AND CLAAS, *Bull. et Mém. Soc. Méd. des. Hôp. de Paris*, 1933, 49: 1177.

after 263.5 grains of veronal had been taken. Perhaps the record case is that reported by Sir James Purves-Stewart and Sir William H. Willcox³. A woman, aged 28, took 125 grains of veronal, 125 grains of allonal, 150 grains of ipral, and 75 grains of quadronox—a total of 475 grains of barbituric acid compounds—and recovered!

Several lines of treatment have been adopted with success in the case of poisoning with drugs of this class. In a case of poisoning with dial, reported by T. J. Orford⁴ in this *Journal*, where 18 grains had been taken, recovery followed the intramuscular injection of 3 c.c. of coramine (a 25 per cent solution of pyridine-betacarbonic acid-diethylamide) on two occasions. This author quotes Killian, Crohn, Glaeser, and Halbfas-Neyas as holding the opinion that the peculiar action of coramine is not limited to accidents occurring during basal anaesthesia, but is applicable against all narcotics to a greater or lesser degree. Killian, in particular, is enthusiastic in regard to the value of coramine. In the severer cases more heroic measures must be instituted. The case of Bertrand-Fontaine and Claas, referred to above, recovered after 6 grains of strychnine sulphate had been administered over a period of 60 hours. Purves-Stewart and Willcox (*loc.cit.*) outline the treatment to be adopted much as follows. Endeavour to promote elimination of the drug. Wash out the stomach as soon as the patient is seen and repeat this two or three times at intervals of 4 to 6 hours; colonic lavage should be employed at once and repeated two or three times at intervals of 12 hours. As coma is prolonged, it is well to give food by the stomach tube at intervals of 6 hours, e.g., coffee, glucose and peptonized milk, in quantities of 15 to 20 ounces. Saline and glucose are given per rectum, 15 to 20 ounces every 12 hours. Lumbar or cisternal puncture and drainage is of great value and, indeed, seems to be the only efficacious measure, once pneumonia has set in. It should be carried out at intervals of 12 to 24 hours according to the severity of the case. Digitalis and atropine are sometimes advisable, and also inhalations of oxygen and carbonic dioxide. Strychnine, hypodermically, in full

doses is very valuable. It is not always efficacious, however.

The antagonism between strychnine and the barbiturates was first demonstrated experimentally. Haggard and Greenberg⁵ proved that the effects of an overdose of either substance could be overcome by administering the other. This fact has been taken advantage of in the treatment of poisoning by the barbiturates, and, conversely, may be recalled with advantage in the case of strychnine poisoning. The remarkable case of Bertrand-Fontaine and Claas has been referred to above. The authors comment on the definite clinical improvement that followed each injection of strychnine. Further, no toxic effect from the strychnine was observed, in spite of the enormous total dose given. Harvier and Antonelli⁶ record recovery after taking 62 grains of gardenal, 3 grains of strychnine being administered in three days; Eschbach⁷, one of recovery after taking 30 grains of gardenal, half a grain being given. Three cases of failure with strychnine are reported, however.⁶ Harvier and Antonelli (*loc.cit.*) in general corroborate the findings of Haggard and Greenberg, but do not agree that strychnine is in all cases a panacea for barbiturate poisoning. They consider that the efficacy of treatment with this drug depends on several factors, some of the important ones being unknown, such as the dose of the barbiturate, the lapse of time, and the susceptibility of the patient. They further suggest that strychnine acts by protecting the bulbar centres against the barbiturate, but if the poison is already fixed there strychnine, even in large doses, will be useless. There seems to be some weight in this contention, for Paraf, Dealy, and Macrez⁸ report a case in which only 23 mg. of strychnine produced a tetanic crisis. Desperate diseases, however, require desperate remedies, and one would be inclined to take a chance with strychnine, at least if the case is seen shortly after ingestion of the barbiturate.

A.G.N.

3. PURVES-STEWART, SIR J. AND WILLCOX, SIR W. H., *The Lancet*, 1934, 1: 6.

4. ORFORD, T. J., *Canad. M. Ass. J.*, 1934, 30: 65.

5. HAGGARD AND GREENBERG, *J. Am. M. Ass.*, 1932, 98: 1133.

6. HARVIER AND ANTONELLI, *Bull. et Mém. Soc. Méd. des Hôp. de Paris*, 1933, 49: 1184.

7. ESCHBACH, *Ibid.*, 1933, 49: 1183.

8. PARAF, DEALY AND MACREZ, *Münch. med. Wchnschr.*, 1933, p. 1815.

THE PHYSICIAN'S RESPONSIBILITY IN PRESCRIBING

SOME thirty years ago, more or less, medical students were carefully instructed in the art of prescribing drugs accurately, effectively, palatably, and elegantly. Even the latinity, such as it was, of the prescription did not escape attention. Pharmacology, therapeutics, and prescription-writing still form parts of the medical curriculum, and more is known at the present day about the actions of drugs and the reactions of the body than ever before; yet it is safe to say that prescribing is rapidly becoming one of the lost arts, if indeed it is not already lost, and Latin, a dead language, is "deader" than ever. Why is this? The medical graduates of to-day should be able, one would think, to combine their drugs in an effective dosage so as to be compatible and form part of a palatable and slightly mixture. Why do they not do so—always? Why do they instead, prescribe No. 24 (P.D.Q.) or Blank and Company's preparation having a trade name which ends in "in", "ex", "al", or "ol"? Worse still, why do they sometimes hand out to their patients a sample bottle, in its original wrapper, of some proprietary mixture, saying, "Try this and let me know how it works?" Why do they tell the patient to go to the drug store and buy some particular proprietary under its trade name? The practitioner who acts thus descends from his throne and delegates his duty to the manufacturer. We wonder sometimes, too, whether he does not derive his physiology, pharmacology, and therapeutics from the same source. Does such an one ever reflect that when he acts thus he acts as the unpaid agent of some drug manufacturing concern? Brethren, such things ought not to be. Is it fair to yourselves? Is it fair to the patient who is paying (or owing) you for your knowledge and skill? We respectfully and humbly suggest that there be a little heart-searching in this matter.

No doubt there are reasons for the situation. We live in a hurried age. The busy practitioner cannot, or will not, take the time to think out and write out his own prescription; it is easier to write down a number or the "catchy" short name of some proprietary article which flashes into his mind—this, in part, the result of

suggestive and intensive advertising. If persisted in this practice becomes second-nature, almost automatic; at its worst it argues for a state of mental laziness that aggravates the original condition. A vicious circle is set up. A frank recognition of the evil, a strong determination, and an acquaintance with the new British Pharmacopæia and the Canadian Formulary would do much to improve matters. Let us investigate things a little further.

We are all aware that there is much that is reprehensible in modern advertising, particularly where drugs and remedies are concerned. We deprecate the easy sale of powerful and dangerous drugs to the general public; we denounce the quack remedies that are offered for the cure of cancer. Do we realize how far we, as a profession, are to blame for, or are parties to, what we are so ready to deprecate? Some new synthetic drug appears on the market; it has a value that becomes gradually recognized; it "makes good". It is prescribed by the physician under its trade name, or, perhaps, recommended to the patient without the formality of a prescription. The product is then advertised as "recommended and endorsed by your physician". Samples are sent to the druggist, who displays them on his counter and soon sells the product over the counter to whomsoever may ask for it. You will notice that you have now become superfluous. The final step is that the departmental or "thrift" store "has it for less". Under these circumstances is it any wonder that the purchaser loses his faith, first in his druggist, whom he now regards as an extortioner, and next in his physician, as little better? For why, indeed, should he pay the latter two or three dollars for a consultation fee when he can obtain the remedy that the doctor always prescribes so much more cheaply from the clerk behind the bargain counter? If the patient recovers, as he may, he recommends the remedy to his friends. As a result the druggist loses custom; the doctor blames the druggist for prescribing; and the doctor loses that patient and, doubtless, several others. In all this the physician has himself to blame.

There is another reason, perhaps even

more cogent, why doctors should be careful in prescribing proprietaries, and that is, the cost to the patient. In these days when the high cost of medical service is under scrutiny, not always reasonable or sympathetic, this is a matter of considerable moment. Proprietaries are, of course, produced for profit. This is not in itself reprehensible, but becomes so if the profit is excessive or if unethical methods are employed to increase sales. Competition is now so keen that the temptation is great to indulge in unjustifiable claims in advertising. Proprietaries do not always represent therapeutic advances, and many of them are expensive out of proportion to their intrinsic value. While not denying that many of the preparations sold under trade and protected names have their place, it is at the same time true that some of them can be obtained much more cheaply if prescribed under their proper chemical designations or by the names by which they are designated in the official pharmacopœias and formularies. For example, Mr. Herman L. Emmerich, Past-President of the Wisconsin Pharmaceutical Association, in an informative and thought-compelling article¹, gives the following comparison of prices which tells its own tale:—

DRUGS UNDER PROTECTED NAMES

	Price per oz.
Atophan.....	\$2.75
Aspirin.....	.85
Diuretin.....	1.80
Duotal.....	1.07
Luminal.....	6.20
Phenacetin.....	.63
Pyramidon.....	.82
Urotropin.....	.63
Veronal.....	3.00
Argyrol.....	1.50

UNDER UNPROTECTED NAMES

	Price per oz.
Cinchophen.....	\$.40
Acetosalicic acid.....	.15
Theobrom. sodium salicylate....	.30
Guaiacol carbonate.....	.28
Phenobarbital.....	3.25
Acetphenetidine.....	.20
Amidopyrine.....	.44
Hexamethylenetetramine.....	.13
Barbital.....	.60
Argento-protein mitis.....	.60

The total cost of an ounce of each of these drugs sold under protected names is \$18.95; of the same sold under unprotected or official names is \$6.35, or one-third.

Of course, some synthetic drugs introduced from time to time seem to meet special indications better than their predecessors, and these may properly be prescribed if the situation is well understood. It is always well, however, to exercise caution and to remember that there are fads and fancies in medical circles, as elsewhere. Fashions in drugs and treatments change, as do fashions in hats or trousers. A drug is not necessarily the "best ever" because it is new; it may be "on the shelf" in a year. The old remedies that have stood the test of years, even of centuries, should have the first call. We well remember being in a medical clinic in Vienna when one of the post-graduate class asked the instructor . . . "Have you used such-and-such in pneumonia. It is just out." The reply was—"No. We do not use any remedy here unless it has been on the market three years." But that was thirty years ago! In that period we have passed from a state of incredulity to the very opposite. Some proprietary preparations, such as extracts and derivatives of the endocrine glands, hormones, and those containing vitamins, from their nature, do not fall within the scope of the compounding pharmacist, and may, properly, be prescribed by the physician, provided that they have been proved to be scientific and can be relied upon to fulfil the claims made for them; provided also that they are not of the "gun-shot" variety. As a rule, physicians are well advised to confine most of their prescribing to the tried and reliable preparations listed in the British Pharmacopœia and the Canadian Formulary. Articles are appearing at the present time in our *Journal* which call attention to some of these, and hints are given as to compounding palatable and pleasant-looking mixtures. In the addendum or Reference Companion of the Canadian Formulary will be found formulæ that can meet most of the needs of the practitioner. These are well worth consideration.

In these days, too, the dispensing chemist is hard put to it to make a decent living, if we may judge from the fact that many of them now operate lunch counters in con-

1. EMMERICH, H. L., *The Diplomat*, 1934, 6: 25.

nection with their establishments; for long they have sold toilet articles, perfumery and candies. Under existing conditions he is gradually losing his character as an educated professional man and becoming a mere salesman. We are sure that the better druggists do not desire this and would

welcome more cooperation between the physicians and themselves. No doubt they would always be ready to assist should any problem arise in connection with the compounding of prescriptions. We make a plea for the home-made prescription.

A.G.N.

Editorial Comments

The Canadian Journal of Occupational Therapy

This is a new quarterly, the first two issues of which lie before us. It is the organ of the Canadian Association of Occupational Therapy, and appears as a result of the conviction that this body now requires a medium of communication between its members, scattered as they are over the whole of the Dominion of Canada.

The opening editorial calls attention to the fact of world-wide unemployment and its attendant mental unrest—despair and resentment—and the menace which this attitude of mind presents to organized society. The remedy is held to be, and rightly, occupation. The Association meets the situation by endeavouring to develop, in hospital and institutional life, a plan for suitable workshops, well-trained workers, and attractive forms of occupation." This has a two-fold purpose, first, "to keep occupied, during at least part of the long tiresome period of invalidism, the minds of those who are temporarily swept aside from healthy living by the ravages of disease and of those who are permanently unable to live normal lives with normal people; secondly, to adapt the method of treatment to the needs of the individual so that by active occupation maimed limbs and minds may be once more restored to health." A noble ambition! Generally in the past physicians, hospitals, and institutions have felt their responsibility ended when the patient passes from their immediate care. They should not be blamed for this—their immediate task is exacting and demands all their attention, yet the fact remains that in not a few cases the after-treatment is as urgent as the earlier medical or surgical care. All will admit this. It is here that the Canadian Association of Occupational Therapy steps in. It supplements the work of doctors, hospitals, mental institutions and convalescent homes, thereby not only helping individual people but performing a service to society. That the Association needs a journal is proof that its organization has "made good" and is a growing concern.

The first number contains, appropriately, articles on the history of the development of occupational therapy; an article on "Occupational Therapy in a Mental Hospital Service," by Dr. B. T. McGhie and Mr. G. R. Myers; an article on the "Value of Occupational Therapy

in Chronic Arthritis," by Dr. A. A. Fletcher; and some case reports. The second contains a number of papers read at the Third Convention of the Canadian and Ontario Occupational Therapy Associations, held in Toronto on October 27, 1933, besides the presidential address of Dr. G. W. Howland and the address of the Lieut.-Governor of Ontario, the Hon. Col. Herbert A. Bruce. Much other interesting matter is presented. The journal is worthy of commendation not only for its pleasing appearance and its interesting subject matter but also for its altruistic aim.

We would commend the Canadian Association for Occupational Therapy to the sympathetic attention of medical men, medical institutions, and the philanthropic among the general public.

A.G.N.

Dr. Helen MacMurchy, C.B.E.

We are pleased to note that Dr. Helen MacMurchy, who recently retired as chief of the Division of Child Welfare, Department of Pensions and National Health, has been designated a Commander of the Order of the British Empire in the recent New Year's Honours.

Dr. MacMurchy graduated in 1900 from the University of Toronto, and was one of the few Canadian women doctors with a private practice during the early days of the century. She was also on the staff of the Toronto General Hospital and gave lectures at the University of Toronto. In 1913 she was made Inspector of Prisons, Hospitals and Public Charities, Inspector of the Feeble-minded and of Auxiliary Classes for the Province of Ontario, and in 1920 was called to Ottawa on the establishment of the Federal Department of Pensions and National Health. She is also on the Council of our Association.

Doctor MacMurchy has done notable work in connection with Child Welfare, doing much to disseminate and popularize information on this important subject and her place in the Department of Pensions and National Health will be hard to fill.

The honour that has come to her is well earned and all who know her will join in extending congratulations. We extend to her also our best wishes for happiness in her retirement.

A.G.N.

The New Dean of the Faculty of Medicine of Laval University

Dr. P. C. Dagneau, has been appointed Dean of the Faculty of Medicine of Laval University, Quebec, in succession to the late Dr. Arthur Rousseau. As professor of clinical surgery at Laval and chief surgeon at the Hôtel-Dieu and later the St. Sacrament Hospital, he is one of Quebec's most prominent surgeons.

Dr. Dagneau was born at Levis in 1877, a member of an old French-Canadian family which first came to Canada in 1649 from Niort, France. He studied at the Quebec Seminary and Laval University, continuing his studies in Paris. On his return to Canada he was named chief surgeon of the Hôtel-Dieu in 1914. He resigned from that position in 1927 and became chief surgeon at St. Sacrament Hospital.

Dr. Dagneau is also a member of Council of

the Canadian Medical Association, and a Corresponding Member of the Editorial board of our *Journal*. He is, therefore, well-known to many of his English-speaking confrères, who will agree in thinking that a wise choice has been made and that the important School under his direction will continue to make the notable progress that it has done in the past.

A.G.N.

Entamoeba Histolytica

Erratum

Attention is called to a serious error which appeared, inadvertently, in Dr. R. H. M. Hardisty's article entitled "Entamoeba Histolytica and Colitis in Montreal", as published in the February issue of the *Journal* (p. 136). On page 137, second column, line 12, the word "gram" should read "grain."—Ed.

Medical Economics

THE DEVELOPMENT OF THE ECONOMIC SITUATION

BY HARRIS MCPHEDRAN, M.B.(TOR.),
F.R.C.P.(C.),

Toronto

To understand the present economic situation of the medical profession, one must consider the building which we call Scientific Medicine. The foundation of this structure was laid in the past ages, poorly constructed and unstable—a curious mixture of superstition, mysticism, experience and wisdom. It was later underlaid and buttressed by truths gleaned from studies in anatomy, then physiology, chemistry, physics, biochemistry, bacteriology, pathology. The clinical superstructure of etiology, signs, symptoms, prognosis and treatment was in early times unscientifically assembled and joined. With the progress of time, scientific rebuilding on a solid foundation was commenced, and we see the building as we have it to-day, incomplete and ever so to remain, but gradually becoming secure throughout.

The building process goes on. Increasing and more delicate work has required more and better trained workmen. This has led to the raising of the standard of education for the workers. The pre-medical, medical and post-graduate terms have been made longer, more thorough and comprehensive. Before a student can begin nowadays the study of medicine he must have passed the upper school examination (senior matriculation). The length of the medical course has had to be increased to provide for what seems a minimum amount of study of an ever-increasing number of subjects

having a direct bearing on the practice of medicine. Following graduation it is considered advisable for the young doctor to do post-graduate work in a hospital. If he intends to specialize, the time necessary is increased to three, four or five years of post-graduate study.

The lengthened course in medicine, increased capital expenditure, increase in accuracy in diagnosis, treatment, etc., have had as a result:

1. An increase in the average age at which practice is begun.
2. A shortening of the number of years in which to gain a livelihood and make provision for old age.
3. An increase in the outlay for equipment, added to by the demands of modern society that a doctor dress well, live well and possess a motor car.
4. Increased time in taking histories and making physical and other routine examination.
5. A natural demand for further and exact information as aids to diagnosis by bacteriological, serological and roentgenological examinations.
6. Treatment in hospital instead of at home for various illnesses and always for surgical operations.
7. Employment of trained nurses and such treatment as diathermy, massage, new and more expensive drugs, in the interests of the patient.
8. Newer methods of treatment, especially surgical.
9. The establishment of small and, later, of extensive research institutes, engaged in study of difficult problems, many having to do with the prevention of disease.
10. Increase in the numbers engaged in teaching and research and consequent demand for

increased monetary appropriations to carry on the same. These things have had as a consequence a general increase in the cost of medical care to the public, principally through: (1) The auxiliary aids required in diagnosis and treatment, but also to some extent through increase of professional fees. (2) The establishment of departments of public health staffed by workers, lay and professional, and engaged in preventing disease.

What effect have these things had from an economic standpoint?

1. We see the practitioners, especially on account of increased capital expenditure and overhead, raising the standard of fees, but at the same time the increased cost of illness in other directions makes it more difficult for him to get a reasonable fee.

2. The activities of the research workers and application of their discoveries by the department of health have destroyed many sources of income.

3. There is an unwillingness on the part of the public as a whole to pay the practitioner of medicine for medical services to the indigent and, at present, to the unemployed. From time immemorial the profession has cared, without thought of remuneration, for the sick poor. With the advance of time and under present conditions this charitable work has become an intolerable burden on the members of the practising profession, who feel that they should not have to provide medical care for the sick unemployed as well as the indigent. For protection against fire and crime, the ordinary citizen willingly pays. Why then, one asks, is he not willing to pay for protection against disease, not only through the activities of the public health services but through the services of the general practitioners who form the vanguard of all health services, and without whose cooperation efforts directed towards the prevention, diagnosis and treatment of infectious diseases must be sadly curtailed?

The world-wide economic depression has thrown this background of our economic troubles into bold relief. Without a brief study of it, one would not be in a position to understand the difficulties of the practitioner.

MEDICAL ECONOMICS IN THE RURAL DISTRICTS OF ONTARIO

BY WARD WOOLNER,

Ayr, Ont.

In spite of the fact that much has been written, recently, on the medical care of indigents or of those on relief, the subject has usually been discussed from the urban standpoint. I propose taking up this question briefly as it applies to rural areas in some parts of Western Ontario.

For many years we have had a clause in the Health Act of Ontario which provides for the medical care of indigents in the municipality. Some doctor must be appointed, by by-law, to give medical care to these people at the expense of the municipality, or in case of failure to make such appointment the medical officer of health should act. Up to 1929, we had few real indigents in our townships and those who were ill were usually attended free by the doctor called. In rare cases, the physician appointed was asked to act, but it was uncommon for a township to have to pay anything for medical care.

Since 1929, rural areas have many families who cannot pay anything to their doctor. Even farmers, who a few years ago were considered well to do—had electricity installed, had motor cars and telephones—cannot pay for medical care to-day. We are asked to accept all kinds of produce on our accounts. The writer received over twenty chickens, several ducks, geese, a turkey, potatoes and wood on accounts during last winter. Many country doctors have trouble collecting sufficient to purchase the bare necessities of life.

A few townships adjoining large cities have accepted the offer of our provincial government to pay two-thirds, the township paying the other third, of the cost of medical care and supplies. These townships are more urban than rural. Some strictly rural areas have also tried the scheme. In one township it seemed difficult to properly supervise this work. The doctors' accounts became so many and so large that the council became alarmed and the medical officer of health was asked to take over all the work. In another township, the Medical Officer of Health has charge of all the medical care for those on relief; he allows the patients to call their own doctors but the accounts must be passed by him before being paid. This seems to work very satisfactorily. Nothing is ever paid for medical care in hospitals, and the doctors do not seem to object very seriously to giving this care gratis.

In one township the doctors are encouraged to keep their obstetrical cases in the homes if the surroundings are suitable. They are paid \$12.00 for each case and nursing care, if needed, is provided at the expense of the municipality. A practical nurse or graduate or the Victorian Order Nurse is used if possible. This costs much less than paying for hospital care and gives the doctor a small fee for his labours.

Some province-wide scheme for providing medical care for all those unable to pay must be worked out. It must be controlled by a central non-political provincial body. It must not be left in the control of the local municipal politicians. It should be supported by funds from the municipal and provincial treasuries.

PAYMENT FOR MEDICAL SERVICE TO INDIGENTS IN TORONTO

The Council of the Corporation of the City of Toronto on December 11, 1933, adopted for a four months' experimental period those Sections of the Ontario Government Order-in-Council pertaining to Medical Services and Medical Supplies in respect to persons in receipt of unemployment relief.

Briefly, the Order-in-Council referred to makes provision for medical treatment in the patient's home or doctor's office by the family or other physician and payment for such service by the Municipality on a basis of one-half the established prevailing rates in that community. The following paragraphs from the Government memorandum are quoted.

"(a) All medical treatment to indigent patients in their homes or in doctors' offices is included, also

maternity services at homes, as well as after treatment, in major emergency operations outside of hospitals; the doctors furnishing the necessary medical supplies.

(b) For such services as outlined in the previous sub-section the doctor may be allowed one-half the established prevailing fee for such service in the community.

(c) Surgical and medical treatment in hospitals or other institutions for treatment of disease and surgical operations outside of hospitals are not included.

(d) Before the medical services and supplies are given, an order in writing for same must be obtained from the Relief Officer, except in very emergent cases where the Relief Officer can give such an order after some part of the services required has been performed.

(e) Accounts for medical services and supplies must be rendered by the doctor in an itemized statement, and each account must show the details of the prevailing charges in the locality for such services upon which the one-half claim is based. *Such account must be rendered to the Relief Officer and forwarded by him to this department.*

(g) Any amount in excess of \$100.00 in a doctor's account for any one month will not be allowed."

Notes on the British Pharmacopœia and Canadian Formulary

The Hypnotics of the British Pharmacopœia

The new Pharmacopœia now provides a wider range of hypnotics than formerly. Chloral Hydrate (Chloralis Hydras) is naturally retained, but its syrup was so infrequently employed that it has been removed.

Barbitone (Barbitonum), the B.P. name for "veronal" or barbitol, is also retained and its soluble sodium salt appears under the name of Barbitonum Solubile. Its trade name was "Medinal". This is, of course, a most important preparation when barbitone is required for intravenous administration, for instance in cases of poisoning with cocaine or strychnine. It has also been used in tetanus, apparently with some benefit. Its dose is the same as barbitone, 5 to 10 grains. Phenobarbitone ("Luminal") appears and also its sodium salt (as Phenobarbitonum Solubile). The dose of both is $\frac{1}{2}$ to 2 grs. The habit that is so common amongst physicians of recommending patients to purchase luminal at the drug store, cannot be too strongly deprecated. While the same applies to all hypnotics, it is particularly true of the barbiturates. Patients get into the habit of taking them, and, though but few acquire any tolerance, they are apt to take them in increasing doses, so that cases of poisoning are not rare and apparently have recently become more common. The barbitones, and particularly phenobarbitone, are apt to give rise to skin rashes of various types, especially erythemata, in certain persons, and for this reason should only be employed under medical supervision.

There are many patients who think they are suffering from sleeplessness, who, if they require a hypnotic at all, need but the mildest members of the group. Consequently the advent of Carbromal ("Adalin") to the Pharma-

copœia is to be welcomed. It appears to be one of the least dangerous, though also least potent, of the hypnotic group.

It would be well for the physician to pay more attention to the period of effect required. For long lasting sleep, the sulphonals, Sulphonal and Methyl Sulphonal, are preferable, and in the lower range of their official dosage, 5 to 20 gr., will produce a relatively prolonged, yet not a deep effect. In full doses many persons notice a feeling of languor on the following day. Again it must be remembered that the prolonged use of the sulphonals in certain individuals may give rise to skin lesions. The authors have noted that the successful use of Pentobarbital (Nembutal) for anæsthetic pre-medication, has led to its being employed as a hypnotic. Its virtue as a pre-medicant is the short duration of its action. In the smaller doses used for sleeplessness, its effect must be too brief to have any great value. Doubtless for such cases, Carbromal, or smaller doses of Chloral or Sulphonal, would be much more useful. No patient should take any one hypnotic for a long period. Even if the cause of the sleeplessness cannot be found, or if found cannot be rectified, which will at times occur, especially with older persons who simply wish to waste time in sleep, the hypnotic used should be changed bi-monthly. Paraldehyde is, of course, the safest, and, were it not for the smell and taste, the best routine member of the group.

Chlorbutol (dose 5 to 20 gr.), Chlorbutanol, Chloretone, is a hypnotic with actions similar to chloral. It has been introduced into the Pharmacopœia because of its use as an antiseptic in adrenaline solutions. It has also a local anæsthetic effect, especially in the stomach.

The Diuretic Group in the British Pharmacopœia

Caffeine remains in the B.P., but the salt in the 1914 Edition, Caffeine Citrate, has been replaced in the 1932 Edition by the Caffeine and Sodium Benzoate (*Caffeinæ et Sodii Benzoas*). This preparation is practically neutral, not slightly acid like the citrate, and, as 1 part dissolves in 4 parts of water, it is much more soluble and useful than the citrate. The citrate has, however, been retained in the C.F. as its frequent use requires that a standard for it should be available.

The B.P. has at last made Theobromine, as the *Theobrominæ et Sodii Salicylas*, and Theophylline, as the *Theophyllinæ et Sodii Acetas*,

official. The former has long been employed under the proprietary name of "Diuretin" and the latter under that of "Theocin". Both these salts are excellent diuretics and lack the central effects of caffeine; hence they do not cause sleeplessness and restlessness. On the other hand, they are more apt to upset the stomach and cause diarrhœa.

As caffeine is often given in diuretic mixtures, it is well to remember that if Caffeine and Sodium Benzoate is put into mixtures with an acetate or citrate a precipitate will form, as the solubility of Caffeine with Sodium Benzoate in an acetate or citrate solution is little greater than that of caffeine alone.

V.E.H. AND G.H.W.L.

Men and Books

HEREDITY AND THE SOCIAL PROBLEM GROUP: A REVIEW*

BY MADGE THURLOW MACKLIN, M.D.,
London, Ont.

This volume, with an introduction by Major Leonard Darwin, and a short chapter of description of aims and methods of research in this particular problem, is composed of 26 pedigrees of families whose members have been on the Poor Law relief in London, Eng. Hence it is a book which is not easily reviewed, and, for the same reason, may be one which the reader is not stimulated to buy. Let me say at the outset that no social worker, no sociologist, no one interested in the financial future of our country, and particularly no one interested in the biological outlook as to the future development of the race can afford to do without this volume. There are no flights of oratory, no propaganda; only facts, which make it all the more valuable for the scientific worker.

If every country in the civilized world spent a small fraction of the sum now spent in amelioration of the conditions of the social problem groups upon investigations of the heredity of those constituting those groups, we would accumulate an amount of data which would force us to grapple with a question which threatens to wipe out all the gains of civilization. I shall shortly state some of the observations in the author's own words; in the meantime I want to summarize briefly one of the pedigrees in the book. I chose it because it was the first, not because it was the one illustrating the highest number of defectives. In about 10 families who inter-married there were 387 persons through seven generations. These records were obtained from parish, poorhouse, and hospital records. They were not based upon information gathered

from the families themselves and left unchecked as to their accuracy. Of this group of 387, 204 were known to have received public aid in one of four different ways, either in the poorhouse, in mental hospitals, in other kinds of hospitals, or through out-door relief. The total number of days during which this group of 204 could definitely be shown to have had relief, from certified records which represent the minimum number of days of chargeability, was just about 94,000; or about 258 years of human life, which the public paid for, to maintain a stock which had in it apparently not one person worth anything to the community.

In 43 members of this pedigree, coming from two families which intermarried, there were 15 who were either imbeciles or who went insane at different ages and had to be kept in asylums. Just one small item from the many which are recorded about these ten families will be given here. "II, 3 and 4 were the parents of this group. Both died in the workhouse after only a short stay there. Their eldest daughter died in the workhouse on her third admission there. Her husband was an inmate of the workhouse, with but one interval, from January, 1893, until September, 1904. They were the parents of three sons and three daughters. One of the daughters was an inmate of the workhouse on five occasions between the ages of 17 and 48, and had an illegitimate child born there. Another daughter was married at the age of 17, became an inmate of the workhouse in that year (1881), and from that time until her death in 1916 was an inmate on 24 separate occasions, spending upwards of 17 years therein. Her husband was an epileptic. He became an inmate of an asylum in 1890 and died three months later. Of their five children, four were born in the workhouse. The total period of chargeability of this last couple and of their children before the latter were 15 years of age was 9,534 days." This is merely one item out of

* Heredity and the Social Problem Group. E. J. Lidbetter. Vol. 1, 160 pages, 21s. net. Edward Arnold & Co., London, 1933.

the many which describe such families, that shows the apathy, the stupidity, of a society which allows such to breed as many as 17 to a family (as some of these families did), while the honest, industrious, intelligent portion of the community cut down their families to two or three children because of the burden of looking after the unfit.

Because of the vital importance of the subject which Dr. Lidbetter has been investigating for the future well-being of the race, I shall now state a few of his generalizations.

There is a sufficiency of common characteristics in this group of persons to justify their constituting a class by themselves, divisible into two groups, those obviously defective, such as the insane, the imbecile, the epileptic, and the low-grade mental type, which is the recruiting ground for the former.

There is assortative mating to a great degree; that is, like tends to marry like. Even where the insanity in the parents had not yet shown itself, children from insane stock tended to seek out and mate with those whose parents were to become insane at a later date. This assortative mating probably accounts for the great variety of defect to be found in these families. It has been suggested that degeneration traits may take a variety of forms, appearing as insanity in one member, as epilepsy in another, as feeble-mindedness in a third. This may prove to be incorrect. It may be that the manifestation of different forms of defect in the same stock is due to the stock carrying many different defective traits, and the genes for these segregate out in different members of the family.

Those who hold that all this defectiveness may be explained upon the basis of poor environment rather than poor heredity must reckon with the facts disclosed by Dr. Lidbetter in his investigation. In the middle of it, the war intervened. Because of the greater opportunity for everyone to find a job, many of the indigents and poor relief recipients were cleared out of the workhouse and put to work. Their environment materially improved. When the war was over, Dr. Lidbetter returned to his research with the idea that all the data collected before would be of little avail, as most of the old inmates of the workhouses would have changed. To his surprise he found most of them back again, and his work could proceed with little interruption. Environment had pulled them out of the slough, heredity had pulled them back again.

In conclusion he says, "The trend of modern movements in all that relates to the socially inadequate is in the *direction of their endowment as a class at the expense of the self-supporting community*" (italics mine). "This arises and continues with the passive consent of the average uninstructed citizen, whose social conceptions are still derived from the teaching of early social economics. Those teachings were neglectful of the problems of original human quality,

and in consequence social organization has proceeded upon the assumption that conditions can make anything of any man. This is to say nothing against the improvement in the standard of life and health which has been the triumph of modern social organization, but rather to assert that it has been one-sided, and that under the best conditions it is human quality that shapes the life of the individual and through him the life of the community. The best in civilization is the best biologically. What is therefore necessary to-day is attention to the problems of reproduction and its control."

ONE HUNDRED MILLION GUINEA PIGS: AND TEN MILLION MORE

A book long overdue and of great importance has just come from the press. The oddity of its title should not detract from its real value.* It is intended to disclose dangerous and generally unsuspected conditions in articles in common use, and the purpose has been fearlessly and consistently pursued by wholly competent observers.

The "100,000,000 Guinea Pigs" are the 100,000,000 inhabitants of the United States who are the subject of experiment by the producers of food, medicine, cosmetics, etc., for the advantage of the producer and experimenter, not of the consumer and experimented upon—and we in Canada can add 10,000,000 in like case. The work deals specifically with many much used and much advertised articles, and points out their defects and dangers. No one can read a popular magazine without being struck by the attractive advertisements of proprietary articles—the high price of \$5,000 a page has not deterred some manufacturers of tooth-paste. And recently the radio has been called into service to detail the marvellous excellence of some preparation or other.

Dealing first with foods, warning is given as to the indiscriminating use of a well-known *Bran* which to many is a powerful intestinal irritant; the arsenic on apples, which is not unknown in Canada, is mostly eliminated by cutting out the two ends, stem and blossom and washing the apple.

The modern drug-store has generally abandoned the illuminated globes filled with gorgeous coloured fluid, and its windows are filled with boxes, cartons, tubes, tins, jars, bottles, packed with liquids, powders, creams, pastes, and what not, for every conceivable purpose, but all intended for the profit of the producer and all intended to be made use of by the unsuspecting consumer. Almost without exception such preparations are of trifling worth for any of the

* 100,000,000 Guinea Pigs: Dangers in Everyday Foods, Drugs and Cosmetics: By Arthur Kallet, Consumers' Research and F. J. Schlink, Consumers' Research; The Vanguard Press, New York, 1932: 8vo. viii, 312 pp.

purposes for which they are advertised and many are dangerous.

Water containing radium, the sale of which was being pressed among us a short time ago, has been definitely discredited by the terrible death last year of a wealthy American user of *Radithor*. Almost equally dangerous are some of the Cancer Cures. Some seem to be simply inert, but all are mischievous in preventing the patient in the early stages from consulting a surgeon.

Electro-Chemical Rings were advertised to cure Bright's disease, epilepsy, diabetes, goitre, catarrh, cancer, etc.: *Bel-Rub* and *Dr. Myers' Pneumonia Compound*, pneumonia and influenza: *Mygrone*, tuberculosis; *Virginia Dare Wine Tonic*, pernicious anæmia; *D-O-D Specific No. 3*, ptomaine poisoning. These were discovered to be frauds and so were *Boracetine* recommended for typhoid, *Kinmonth's Diphtheria* and *Sore Throat Remedy* and *Campbell's Safe Complexion Wafers*.

Some external remedies may be added to the list: *Allen's Universal Salve* for wounds, etc., and *B. & M. External Remedy* for a score of diseases ranging from cancer to pneumonia, "the only known penetrating germicide".

Some preparations are simply inert. For example, *White's Scar-Pax*, guaranteed to cure scarlet-fever or smallpox in three days, which was found to contain in a \$15 pint bottle nothing more potent than a half-cent's worth of cream of tartar dissolved in water; so *Eksip*, curing diabetics but allowing them to eat anything, consisted essentially of carbonate of magnesia, tale and starch and would have been harmless but that it sent many diabetics to the grave by the fatal regimen permitted. So-called Magnetic Cures are not uncommon, generally under a quaint name such as *I-ON-A-Co*, or *Vit-O-Net*.

Almost without exception, we are told, the proprietary antiseptics commonly displayed in the drug store window cannot be trusted to destroy germs under ordinary conditions of use, and whoever depends on their antiseptic actions in emergencies is taking a foolish and unnecessary risk. Of *Listerine*, which seems to owe much of its vogue to a supposed connection with Lord Lister (it is needless to say there was none) the American Medical Association says: "The supreme ridiculousness of the situation becomes apparent when it is realized that the antiseptic virtues of *Listerine* are so infinitesimal in comparison with better antiseptics as to invalidate even modest claims made for it. . . ." *Pepsodent Antiseptic* now so persistently advertised on the radio is worthless for the prevention or treatment of colds or sore throats; and is but a weak antiseptic for minor cuts, etc., in which an efficient first-aid is found in tincture of iodine and in most cases neither is of any real effect as a mouth wash for bad breath, and to neglect the basic cause by their use is exceedingly unwise.

Lydia E. Pinkham's Vegetable Compound is dangerous as it is a relatively weak and worthless preparation, the use of which may delay competent treatment.

As to tooth-pastes it is said that "probably no other commodity has been responsible for so much downright lying as tooth-paste has. Despite all claims to the contrary, no tooth-paste will keep your teeth from decaying, even if you use it ten times a day; no tooth-paste that is safe for daily use will make your teeth white in one day, three days or a thousand days; no tooth-paste will prevent or cure pyorrhœa or any other disease condition of the gums or mouth; no tooth-paste will correct, except during an insignificant interval immediately following its use, acid condition of the mouth; no tooth-paste will destroy enough organisms to make any difference in anyone's health or well-being. In other words, a tooth-paste is simply a slight cleansing aid and nothing more . . ." The best, as it is the cheapest, dentifrice is a simple salt solution, or baking soda, or precipitated chalk—cheap, easily obtainable and absolutely safe. *Pebeco* involves risk, because its principal ingredient is a poison, potassium chlorate. "In 1910, a German army officer committed suicide by eating the contents of a tube of *Pebeco*."

The morning "Salts" come in for attention. The principal ingredient of *Kruschen Salts* is *Epsom Salts* and if you have constipation as well as obesity, *Kruschen Salts* may aggravate the constipation; if you have not constipation the salts may supply you with a chronic case. It is idle to speak of such salts with a basis of *Epsom Salts* as not habit-forming. The same may be said of an aloe basis. The young woman who took every night *Dr. Edward's Olive Tablets* "a pure vegetable compound, non-habit forming" was visited with a chronic and unmanageable constipation. *Ex-Lax* the "delicious chocolate laxative" is equally dangerous; and *Sal Hepatica* is best avoided, "hoary old cure-all cathartic" as it is.

Cosmetics and other beautifiers are generally unsafe—*Othine* may remove freckles, but is apt to replace them with inflammation and dark blotches; depilatories are not always safe, as witness the now outworn *Koremlu*. The only permanent depilatories are electrolysis and x-rays and either may be disastrous in unskilful hands.

The conclusion of the whole matter is—avoid every proprietary medicine, depilatory, cosmetic—avoid eating fruit which may have some remains of insecticide, wash the apples and cut out blossom and stem ends; see your doctor when you are sick, constipated or otherwise; trust your dentist about your teeth.

This book as interesting, even amusing, as it is instructive should be read by everyone who is interested in the public health or his own—and who is not?—Reprinted from *Health*, 1933, 1: 16.

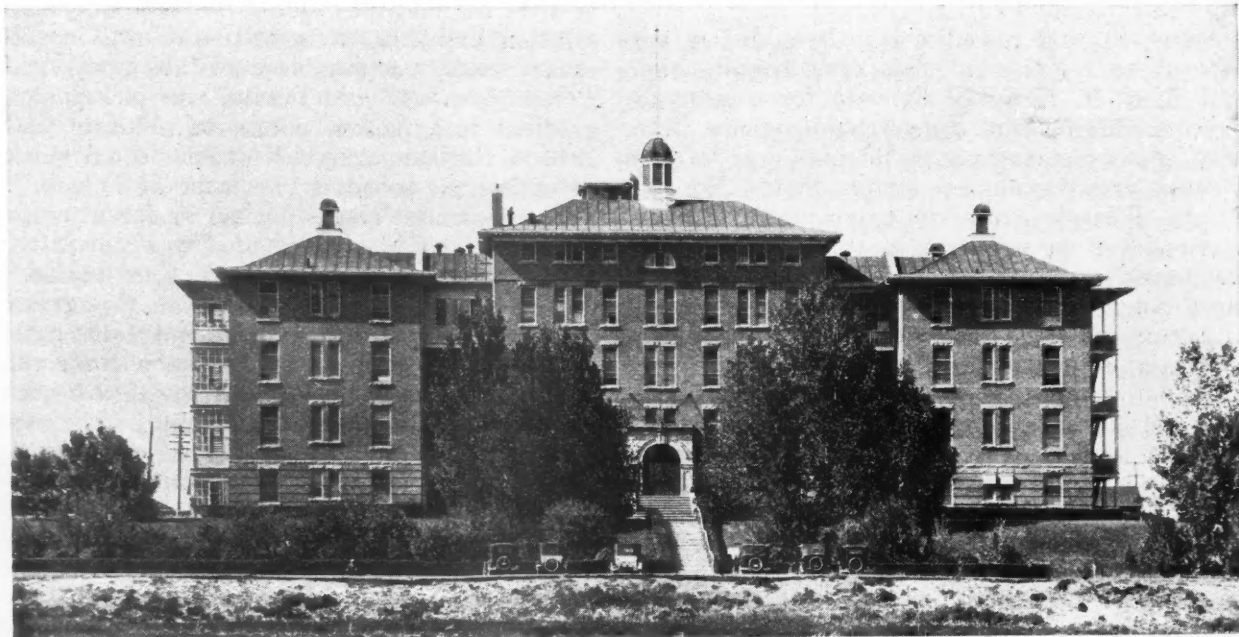
Association Notes

The Sixty-fifth Annual Meeting of the Canadian Medical Association at Calgary, June 18th to 22nd, 1934

The Public Hospitals of Calgary and the Earlier Medical Practitioners

The early history of our Calgary public hospitals is similar in many ways to that of every town of any size in this western country. For several years no hospital accommodation was available. The sick were cared for in their own homes or, if from the country, wherever housing space was available, as in the Royal Northwest Mounted Police Barracks Hospital or elsewhere in the town. There were no physicians within a radius of more than a hundred miles of Calgary in those days, so that from the ranches in the foothills and the prairies and from the

such an emergency." It was some years, however, before a hospital became a reality. In the meantime, Mrs. Cyprian Pinkham, wife of the late Lord Bishop of Calgary, and associated with her Mrs. William Pearce, Mrs. H. G. Mackid, Miss L. Meyer, Mrs. D. Marsh, Mrs. Perley, Mrs. Allan, and others, realizing the great need of having the sick, especially the victims of typhoid fever, coming to Calgary from construction camps on the railway properly cared for, were instrumental in collecting funds to start a cottage hospital. As some of the residents were under the impression that this would be under Anglican auspices, Mrs. Pinkham gave the amount collected to a committee appointed by the Mayor, Dr. J. D. Lafferty, to form a nucleus for the establishment of a general hospital. A charter for this hospital was granted in 1890, and the charter members of this hospital were, Mr. D. W. Marsh, Mr. G. C. King, Mr. Amos Rowe, Mr. William Pearce, Mr. James Walker,

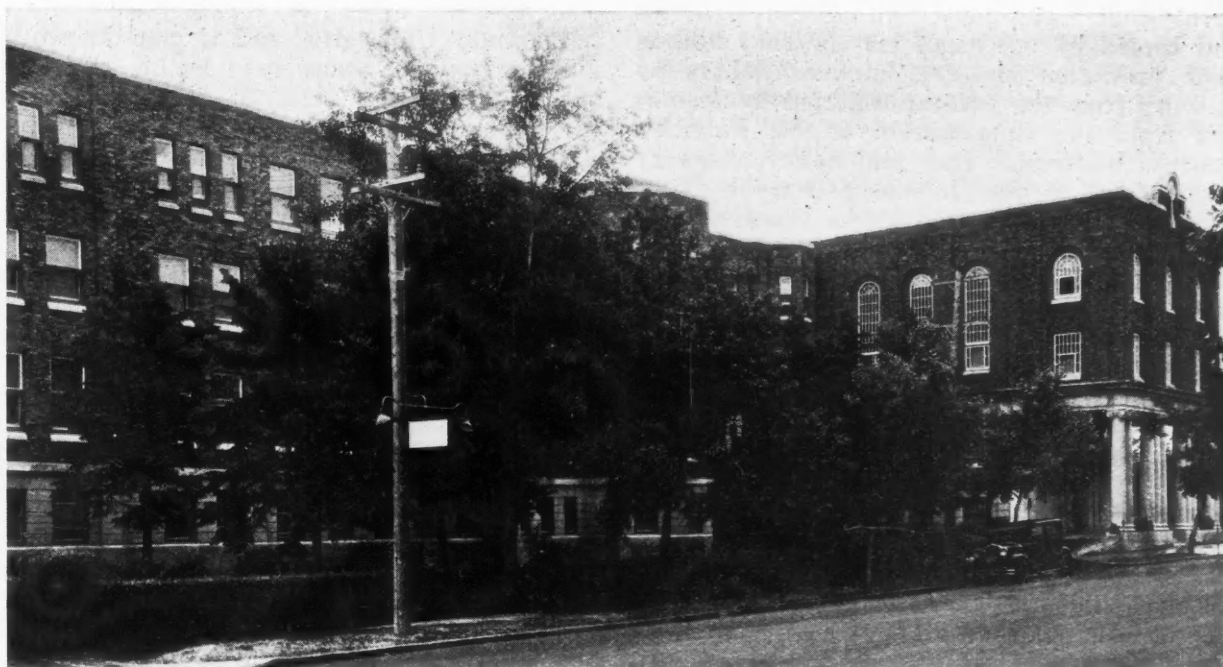


General Hospital

railway construction camps came the sick and the injured. There were numerous accident cases and typhoid fever, which was commonly called "mountain fever", was not of infrequent occurrence. On July 2, 1884, the *Calgary Herald*, realizing the necessity and urgency of a hospital in this community, remarked that "Benevolence is the handmaid of religion. A public hospital is a necessity where the majority of a community are single men. Lacking the care bestowed on the sick at home, an institution is needed that will as nearly as possible supply this. At present the only place for sick is the Police Hospital. Kindly have patients been cared for while there, but we know not how soon an order may be issued by the authorities at Ottawa for the non-admission of civilians into the Police Hospital. It is well to prepare for

Bishop Pinkham, Mr. A. D. Braithwaite, Mr. Herbert Thompson, Mr. C. B. Rouleau and Mr. James A. Lougheed. Thus the first General Hospital was opened in a frame building which still stands at the south-east corner of Seventh Avenue and Ninth Street West. It accommodated eight or nine patients. Upon the recommendation of Drs. H. G. Mackid and E. R. Rouleau, Mrs. Nelson Hoad, the first graduate nurse in Calgary, was appointed Matron and the Hospital opened in October, 1890. Prior to this time the Women's Hospital Aid Society had been organized and was composed of members of all denominations, who did wonderful service in equipping and maintaining the hospital.

During the first year 123 patients were treated with 8 deaths. The first annual report of December 31, 1891, stated that "At the present



Holy Cross Hospital

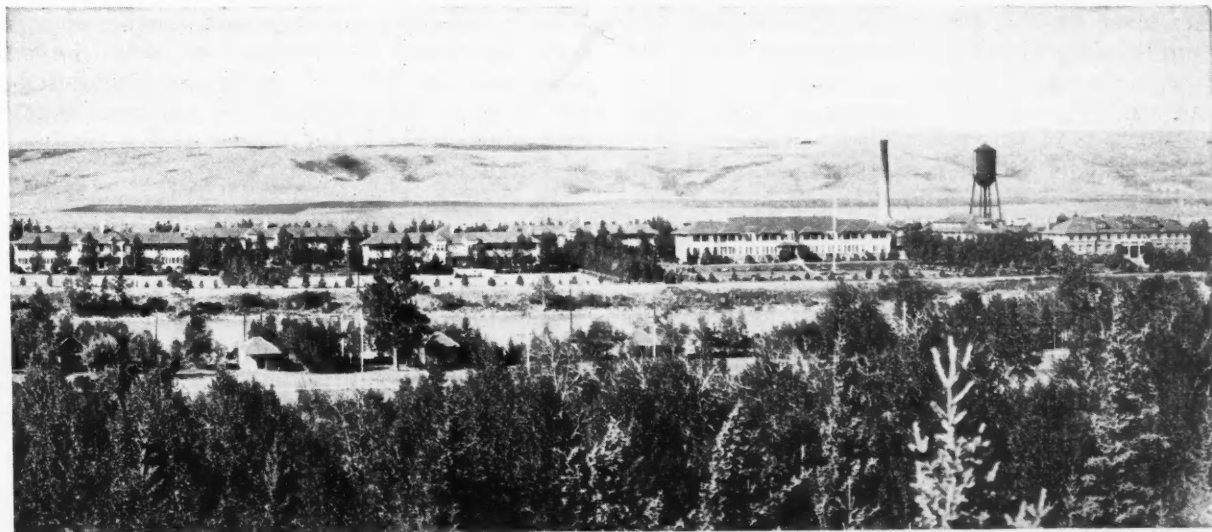
time 6 patients are still in the hospital, leaving 109 who have been cured in this institution," which was a very creditable record. Nineteen surgical operations were performed during this period and 36 cases of typhoid fever had been treated.

In 1895 the General Hospital was moved to a larger and more suitably equipped building on Twelfth Avenue and Sixth Street East, and in 1898 the first trained nurse, Miss Marion Moodie, graduated from this institution. With the large influx of population during the early years of this century, it became apparent that a much larger accommodation for patients would be required. In 1908 the building of the present General Hospital was commenced and in 1910 was completed and opened for the reception of patients. It has a capacity of 214 beds. From the Nurses' Training School of this institution

551 nurses have graduated. The Isolation Hospital, affiliated with the Calgary General Hospital, has accommodation for 70 patients.

In 1899 a maternity hospital was erected immediately to the west of the General Hospital and in 1905 a new maternity hospital was built south and west of the maternity hospital erected in 1899. When the present General Hospital was completed in 1910, a ward was set apart for maternity patients and the former maternity hospital was closed.

The early history of the Holy Cross Hospital commenced with the arrival, early one cold winter's morning, to be exact, on January 30, 1891, of four Sisters of the Grey Nuns from Montreal, and they had their trials and tribulations before their hospital was finished. The first building had not been completed when they took possession of it. It was a small structure



Keith Sanatorium

twenty-four feet square, two storeys in height and heated by one small stove. They had in their possession under a hundred dollars remaining from the amount collected by friends and from the congregation of St. Patrick's Church, Montreal. They had however, a very competent Superior, in the person of Sister Carroll, who gave devoted service through many years. The first patient was admitted on April 10, 1891, and ever since this time this hospital has steadily grown. In 1892 a new building was opened on the site of the present hospital. From time to time new wings have been added until in April, 1929, a splendid addition was made at a cost of several hundred thousand dollars and the entire hospital brought well up to date in every way. The training school for nurses was opened in 1907, and 5 nurses received their diplomas three years later. Since then 402 have graduated. The Holy Cross Hospital has accommodation for 300 patients. Both of these general hospitals have staffs of nearly one hundred physicians.

The problem of giving adequate care to tuberculous patients was in large measure solved when, in the year 1919, the Dominion and Provincial Governments jointly decided to erect a sanatorium. A more suitable location could not have been chosen in proximity to Calgary, one on the north bank of the Bow River, about nine miles west of this city. The extensive buildings are located on a plateau well above the high water of the spring freshets of the Bow River, and here in the brilliant Alberta sunshine and invigorating atmosphere, many an afflicted one has been restored to health. These buildings were opened in September, 1920, and from this time until the present the welfare of these patients has been under the direction of Dr. A. H. Baker, the Superintendent. During the first five years the Sanatorium was under the D.S.C.R. of the Dominion Government, where ex-soldiers afflicted with tuberculosis were cared for. Seventy-five beds were reserved for civilian patients. In July, 1925, the Sanatorium was taken over by the Provincial Government, and is under obligation to reserve a certain number of beds for ex-servicemen. There are 4 physicians and 20 graduate nurses on the staff. There are 210 beds in this institution.

The Colonel Belcher Hospital, D.S.C.R., on Eighth Avenue West, under Major A. W. Park, takes care of returned soldiers and has accommodation for 130 patients.

The Red Cross Hospital for children, situated in the Mount Royal district, has been in operation during the past fourteen years, and there is room for 48 patients. Here many orthopaedic patients are treated.

As Calgary was just an outpost and a station of the Northwest Mounted Police in 1874, the surgeon attached to the headquarters at Fort Walsh, later Fort Macleod, at this time was the first of our profession to practise in this vicinity.

This was Dr. George A. Kennedy, a graduate of Toronto University, and a man known to many of us and remembered by his genial yet strong personality. His duties as surgeon to the Police Force at Fort Walsh took him over a wide stretch of territory and the police detachment in Calgary was under his care; until the first civilian physician arrived, civilians were looked after by him.

Much interest is centred in Dr. Arthur Henderson, a graduate of McGill University of 1880, who now lives at Powell River, B.C. His classmates at McGill University were the late Professor James Bell and Colonel F. H. Mewburn, Professor of Surgery in the University of Alberta. Each served his internship at the Montreal General Hospital under such well known physicians and surgeons as Drs. Roddick, Ross, Wilkins, Gardner, Shepherd, Armstrong, and Osler. In a letter which Dr. Henderson wrote he stated that he "Left for the Northwest about 1883, arriving at the end of the track ten miles east of Maple Creek en route to Calgary, Dr. Mewburn having already assumed the duties of Medical Superintendent of the Winnipeg General Hospital during the Fall of 1882. The journey from the end of the track to Calgary was made by cayuse in spells and occupied the following six weeks. Forging the Saskatchewan River at Medicine Hat and the Bow River at Calgary, I arrived at Calgary on June 8, 1883, and at once located on the east side of the Elbow River near the old Hudson's Bay Fort."

Shortly after this Dr. Neville Lindsay came and began to practise, and in June, 1884, Dr. R. G. Brett arrived on railway construction work and it was not long before he went with the Canadian Pacific line of rail into the Rocky Mountains. He later settled at Banff, where he became widely known in connection with the Banff Springs Sanitarium. By the year 1889 Drs. F. H. Rouleau, J. D. Lafferty and H. G. Mackid, were established in practice and some others had come and gone. In 1892 Dr. R. D. Sanson began to practise and continued in active work until the Great War, when he went overseas. On his return he was appointed to the Pensions Board where he has been engaged ever since. He is the *doyen* of the profession in Calgary.

In 1899 the Canadian Medical Association met at Banff and at the conclusion of this meeting members of the profession from the Northwest Territories organized the Northwest Medical Association with the following officers: Dr. G. A. Kennedy, Macleod, President; Dr. R. G. Brett, Banff, Vice-president; Dr. O. C. Edwards, Fort Qu'Appelle, Secretary-treasurer.

A. H. BAKER,

G. E. LEARMONTH,

on behalf of the Local Publicity Committee, C. M. A.

Hospital Service Department Notes

Medical Men on the Governing Boards of Hospitals

Probably no subject has received more attention than that dealing with doctors acting as members of a hospital Board. Their knowledge of medical science, nursing, the care of patients, sanitation and the best type of buildings, would seem to render them highly qualified for such a position. But it is argued, on the other hand, that members of the regular medical staff and outside doctors who make use of the hospital wards should not be governors, for fear of such individuals using their position to favour their own interests, or for fear that the medical opinions expressed by them would represent their own opinions rather than that of the medical staff. While this objection may be supported by specific instances here and there, the view could be as readily advanced that such an occasional situation does not prove that medical men have no place on the Board, but rather that the method of appointing such men to the Board may have been at fault. Hospitals would avoid almost all of the difficulties, practical and theoretical, were they to arrange that no practising physician should be on the Board unless he were a representative of the medical staff; that such representative endeavour at all times to truly speak for the medical staff as a whole; that he be responsible to the medical staff; that he be appointed by them, not for them; and that the medical men realize the importance of appointing to such a high honour only those of their number whose altruism and judgment and willingness to cooperate, rather than the reverse, are beyond question. However, in those instances where it is deemed advisable to limit the Board to lay members, there can be no objection, and indeed there are good reasons in support of the practice, now becoming fairly well recognized, to the medical staff appointing a small committee to act in an advisory capacity to the hospital board—"Relations Between the Medical Staff and the Hospital," Bulletin No. 7, of the Canadian Hospital Council.

Removal of Surgical Drains by the Nursing Staff

At the request of the medical staff of one of our hospitals the Department of Hospital Service recently gathered information from a number of hospitals in various parts of Canada with respect to whether or not such hospitals

permitted surgical drains to be removed by the nurses on the wards. An analysis of the replies received indicates that there is some divergence of practice, but that the majority of these hospitals take cognizance of the legal responsibility involved in this procedure and require the surgeon in charge to assume such responsibility. In the majority of the hospitals only the surgeon or his assistant removes any surgical drains. If there be an intern in the hospital, he may perform this function. Some hospitals permit a graduate nurse to remove the drain, provided the surgeon assumes the responsibility, and in some hospitals the nurse may do so if the tube is falling out or in other emergencies. One hospital permits a senior nurse to shorten a tube under the doctor's orders, and another permits graduate nurses to remove vaginal drains. Certain hospitals are very strict concerning who should remove the drainage tubes or gauze in hæmorrhage cases or where hæmorrhage may be feared. Student nurses are seldom allowed the privilege of removing drains except in very minor cases. Obviously, in smaller hospitals where interns are not available, certain graduate nurses on the staff take a greater responsibility for clinical procedures in the wards, and are sometimes entrusted with this duty by the surgeon.

Hospitals in which the standing orders on this point are not clear should have this matter rectified in consultation with the medical staff. Various court decisions have emphasized the necessity of keeping in mind the fixation of responsibility should some untoward result develop. The "master and servant" relationship is a fundamental principle at law upon which has been based many hospital decisions. In view of the fact that the pupil nurse or the graduate supervisor is an employee of the hospital, the hospital may find itself burdened with the responsibility for the action of such individual, even although the nurse was acting on instructions from the doctor. For this reason many hospitals either do not permit the nursing staff to remove rubber or other drains, or require the surgeon giving such order to assume full responsibility for her actions. It should be borne in mind, however, that the special nurse is in a somewhat different category, inasmuch as she is considered to be the "servant" of the patient, not the hospital, and therefore the hospital is not so likely to be involved in any action for negligence against such nurse. Even so, the replies indicate that some hospitals do not permit special nurses to remove drains, or, if permitted, require the surgeon to assume the responsibility.

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

Medical Societies

Congreso Internacional de Lucha Científica y Social Contra el Cancer,

Madrid, October 25 to 30, 1933

The proceedings were inaugurated by an eloquent address by the President of the Republic, who received the delegates from all countries and the great number of members of the Congress with expressions of hearty welcome and the hope that important benefits would emerge from their deliberations.

Out of the very full program it is hardly permissible to single out specific communications. The early sessions were devoted to pre-cancer, early diagnosis, and the histological concept of malignancy. The intervening sessions dealt with social hygiene, and the question of organization of the campaign against cancer. The later sessions dealt more especially with treatment—the newest phases in radiation therapy, and with treatment of cancer in special sites, notably, in the central nervous system.

Professor Roffo's work was prominent in all these departments of the subject, and included the presentation of a cinematograph film illustrating the work at the Buenos Ayres Centre, especially as being educative for the laity.

Among many speakers during the middle sessions, Dr. Ewing's insistence on the necessity of awakening a public conscience in regard to cancer produced a notable effect. Defective ideas of personal hygiene, avoidance of sources of irritation which are well-established as precursors of the disease, cleanliness of the skin, and care in regard to food and drink are all matters for urgent consideration and promulgation.

Among the later sessions, Fishera's paper excited much attention. According to him there is an oncolytic substance in the young subject which prevents proliferation of cancer cells, and defects in internal secretions later lead to the disappearance of this substance. Treatment must therefore be directed to correcting these endocrine deficiencies, and instituting an oncolytic organotherapy. Blumenthal and Jacobs reported on their development of a therapeutic agent on these lines (namely "I.B.5"), into the preparation of which there enters extract of intestinal mucosa after certain preliminary steps. Dr. Rodriguez Lopez, speaking of the importance of fractional dosage of x-ray treatment, was accorded much attention.

The social side of the Congress was carried out on nothing less than a magnificent scale, in which all the attractions which only Spain can offer were liberally presented. The conducted visit to the incipient University City must

have impressed the many who took part in it, though perhaps many would have also liked to see the University as it is now, by comparison with the projected future. President Zamorra emphasized his interest in the problem of cancer by a further reception at the National Palace.

O. C. GRUNER

The Calgary Medical Society

On January 9, 1934, the members of the Calgary Medical Society listened to an entertaining address by Dr. R. B. Deane, on "The King's evil."

On February 6, 1934, the members were afforded an opportunity of hearing both sides of the question in regard to certain dental subjects. Members of the Calgary Dental Society cooperated by giving papers of much interest. For the Dental Society, Dr. J. M. Caffery's subject was "Mouth hygiene," and Dr. O. B. Whitman's "Sacrifice of teeth. Which? When? Why?" The discussion was opened by Dr. D. J. Macnab and Dr. G. A. Anderson, members of the Calgary Medical Society.

G. E. LEARMONTH

The Lincoln County Medical Association

The regular meeting of the Lincoln County Medical Association was held on January 18th, at the St. Catharines General Hospital. This meeting was attended by the members and visitors from Niagara Falls, Welland, and other centres, to the number of 54. An excellent presentation of the subject, "Skin diseases as seen in general practice", was given by Dr. W. T. Connell, of Queen's University, Kingston, and was supplemented by the presentation of 14 cases. A short address was then given on Ontario Medical Association matters by Dr. Colbeck, of Welland, District Counsellor. Refreshments were served in the Leonard Nurses' Home.

During the business period of the meeting a committee, composed of Drs. Shaver, Greenwood and Poirier, was appointed to see the local representative in the Provincial Legislature to protest against the proposed osteopathic legislation.

J. H. ELLIOTT

The Toronto Biochemical Society

The twenty-sixth meeting of the Society was held under the auspices of the Provincial Department of Public Health, Toronto, on January 18, 1934. The following communications were received, which are published in abstract.

SILICOSIS

By A. R. RIDDELL

Silicosis has increased in importance during recent years, but it has existed for centuries and

has been ascribed to dust inhalation. Dust inhalation is universal. The lungs are equipped to handle normal amounts of dust; their action breaks down when excessively dusty atmospheres are breathed. These dusty atmospheres are generally encountered in connection with industry. Certain industrial dusts occasion fibrosis when inhaled. Such dusts generally contain silica. Excessive silica in the lung produces fibrous nodules and these characterize the disease called silicosis. The fibrous tissue formation in silicosis continues when once initiated.

Silicosis is a serious disease which is apt to be complicated by tuberculosis. The seriousness of silicosis and tuberculosis is illustrated by the fact that from a group of 356 cases, examined and partly followed over a period of approximately six years, 116 persons produced sputum in which tubercle bacilli were found. Ninety-six persons had died and in 78 the cause of death was tuberculosis.

Silicosis constitutes a serious economic problem. The cost to industry is heavy, but the cost to the general community through the development of tuberculosis from contact with infected silicotics with positive sputum is probably enormous.

THE TOTAL SILICA CONTENT OF THE LUNGS FROM CASES OF SILICOSIS

By H. E. ROTHWELL

A survey is presented of the results of total silica determination of 43 lungs, 34 of which were classed as silicotic and 9 as non-silicotic. The results were given as per cent silica of wet and dried lung, per cent silica of total ash, per cent ash of wet and dry lung. Average high and low figures were presented for the groups. The method of analysis was given as carried out in the laboratory of the Division of Industrial Hygiene, Ontario Department of Health. Comparison was made of the results obtained here with those of other observers. Results of determination of silica in dried lung tissue, together with exposure to siliceous dusts are as follows:

		No. of lungs	Percentage of SiO_2 in dried lung	Exposure (years)
Silicotic	34	Low	0.26	6
		Average	1.73	12
		High	7.59	23
Non-silicotic	9	Low	0.033	
		Average	0.129	
		High	0.517	

THE SILICATE CONTENT OF SILICOTIC LUNG ASHES

By C. M. JEPHCOTT

Sections of lungs of 7 miners, who had worked in the Porcupine Gold Mines from six to fourteen years, and who at the time of death showed pathological changes in their lungs due to the

inhalation of dust containing siliceous material, were used in the experiment. The lungs were digested in cold concentrated nitric acid. After two weeks, when the lungs were completely slimed, the solution was filtered and the precipitate which contained the acid-insoluble portion of the ash (silica and silicates) was incinerated to remove the organic material. The ash was again washed with nitric and hydrochloric acids, to dissolve out the last traces of soluble salts.

The silica and silicates comprise from 22 to 51 per cent of the total lung ash. When viewed under polarized light these siliceous ashes are seen to contain a large number of small fibrous needle-like crystals. A chemical analysis of these insoluble ashes gave the following results (average of the seven samples): 73.6 per cent SiO_2 , 17.1 per cent Al_2O_3 , 2.5 per cent K_2O , 2.1 per cent CaO and MgO , 3.5 per cent H_2O . From a consideration of these figures it is seen that acidic and basic silicates comprise approximately one-half of the insoluble ash, the remainder being silicon dioxide.

DENTAL CARIES FROM THE BIOCHEMICAL STANDPOINT

By F. F. TISDALL

Williams, Anderson, Halderson and Summerfeldt have shown that the addition of vitamin D to a diet already containing a daily intake of 24 ounces of milk, meat or eggs, 1 or 2 vegetables besides potatoes, and fruit, cut tooth decay in half. Their work was most carefully controlled by x-ray examination of the teeth. A diet built up around milk, meat, eggs, vegetables and fruit in itself is of value in reducing dental caries. Some other observers have noted the beneficial effect from large amounts of orange juice, and others from the administration of alkali-forming foods. A survey of all these results shows that a diet built up around milk, meat, eggs, vegetables and fruit—rich in calcium and phosphorus should tend to promote calcification. The administration of large amounts of orange juice should tend to make the intestinal contents more acid and to change the metabolic activity towards alkalinity, thus promoting absorption and deposition of calcium salts. The same holds true for the administration of alkaline-forming foods. It is thus evident that the beneficial effects obtained in the reduction of tooth decay by widely divergent methods all have a common factor in that the procedures used should tend to increase calcification.

STATISTICAL ANALYSIS OF THE DENTAL CARIES INVESTIGATION REPORTED BY F. F. TISDALL AT THE DECEMBER MEETING

By C. B. WELD

The figures analyzed are taken from the original work of Anderson, Williams, Halderson and Summerfeldt, who reported that vitamin D

reduced the incidence of caries in institutional children of from 3 to 16 years of age.

1. The favourable effects of the vitamin in reducing the *number of new cavities per child* were shown to be significant only in the children of 3 to 10 years and to be absent in the older groups.

2. The number of *new cavities per tooth* has been reduced by the vitamin equally well in the deciduous and permanent teeth. These results are statistically sound.

3. The apparent reduction by the vitamin in the number of *markedly progressive cavities per child* is not statistically significant.

4. The number of cavities present at the original examination of the children did *not* parallel the number of new cavities which later developed.

5. The incidence of new caries within family groups was as well reduced by the vitamin as was the case of groups with no family relationship.

The Winnipeg Medical Society

The regular monthly meeting of the Winnipeg Medical Society was held on January 19th in the Physiology Lecture Theatre of the Medical College. Dr. Blake Watson read a paper on "The treatment of malignant diseases at the University of Munich Gynaecological Clinic," and Dr. J. D. McQueen and other members of the Tumour Clinic and Cancer Relief and Research Institute spoke on the "Treatment of carcinoma of the uterus." Dr. E. S. Moorhead presented a report from the Committee dealing with medical care of those on unemployment relief.

ROSS MITCHELL

Special Correspondence

The Edinburgh Letter

(From our own Correspondent)

The death of Sir Donald MacAlister, Chancellor of the University of Glasgow, removes an outstanding personality from the public life of this country. Sir Donald's interests were as varied as his intellectual attainments. He was not only a distinguished physician but a brilliant mathematician and scientist. He had travelled extensively and the study of foreign languages was one of his many hobbies. Sir Donald was born at Perth on May 17, 1854. His father was Mr. Donald MacAlister, formerly of Tarbert, Loch Fyne. The MacAlisters of Tarbert were for long the hereditary keepers of the castle there, the ruins of which still stand. He spent his early years in Glasgow, and from there removed to Aberdeen, and thence to Liverpool, becoming agent of Messrs.

Blackie and Son, publishers. In the late sixties Sir Donald was a student at Aberdeen University, having so far paid for his educational studies by means of bursaries. He took the highest place in successive years in Oxford Senior, Cambridge Senior, and London Matriculation. He secured five gold medals in science and art examinations and also scholarships at Oxford and Cambridge. In 1879 he was Senior Wrangler at Cambridge; and in 1881 he graduated Bachelor of Medicine, having studied at St. Bartholomew's Hospital. His many activities earned for him a notable reputation in the medical and scientific world, and it was a popular appointment when in 1905 he became President of the General Medical Council on the retirement of Sir William Turner, Principal of Edinburgh University. Sir Donald filled that high office with conspicuous ability until failing health compelled him to retire in 1931, when he was succeeded by Sir Norman Walker, of Edinburgh. In 1906 he was President of the Therapeutic Section at the meeting of the British Medical Association in Toronto. In 1907 Sir Donald was appointed Principal of Glasgow University. The record of the progress of the University during the ensuing 22 years bears ample testimony to his administrative capacity. Six months after his period of office as Principal expired he was elected Chancellor of the University in succession to the late Lord Rosebery. Scottish University education owes to him a deep debt of gratitude.

The Students' Representative Council of the University of Edinburgh has just completed the fiftieth year of its existence. It was in the year 1884 that a general meeting of the students of the University was held, at which it was resolved that such a body should be instituted, and the first meeting of the newly elected Council took place in January of that year. The idea underlying the formation of the body was that such an organization would be a useful medium through which the wishes of the students and any grievances they might feel might be brought to the notice of the University authorities. The other Scottish universities quickly followed the lead given by Edinburgh, and Students' Councils came into existence, not only in Scotland but in other countries. A few years later the Scottish Universities Commission recommended that the Students' Representative Councils should be recognized as part of the organization of the universities. The Councils have therefore a statutory position in the universities of Scotland.

Many of the friends of Professor Robert Muir of the Chair of Pathology in Glasgow University would observe with great pleasure that the honour of Knighthood has just been conferred upon him. Sir Robert was President of the Section of Pathology at the Annual

Meeting of the British Medical Association held in Winnipeg in 1930.

Professor D. K. Henderson, of the Chair of Psychiatry in Edinburgh University, was recently the guest of honour at the annual dinner of the Dumfries Academy Former Pupils' Association. In an after-dinner speech he said that people often asked him what psychiatry was—but, before he explained, he wished to remind them of the lady who asked a well-known doctor the question—"What is Harley Street?" "Madam," the doctor replied, "Harley Street is not a street. It is a conspiracy." Professor Henderson went on to say that psychiatry was neither a puzzle nor a conspiracy, but was the name which hid the identity of the Cinderella of the medical sciences. She was gradually getting into closer touch with her sister sciences, medicine and surgery, and bade fair to take a more prominent place in general medical work than had been the case heretofore. For he believed a knowledge of psychological medicine was of more value to the good general practitioner than any other quality he might possess. He might not know that he had it, but whether he knew or not, the doctor who had psychological insight would think of his patients as individuals rather than as groups of organs. He would treat the man more than the disease. It might be wondered why he was dwelling on this matter at all, particularly in an after-dinner speech. But his reason was that he believed much more directly than he could explain that night that psychiatry had a very close interest in world affairs and in race betterment. He further said that it was of interest to note that perhaps a good deal of the distress and embarrassment which existed in the world to-day had been due to the over-development of the physical and material sciences, and yet it was only by the utilization of more science that a solution could be effected. This apparent paradox was explained by the fact that the science which had produced the cause or causes was totally different from the one which was likely to effect a cure. The latter must be of the type which concerned itself more directly with human welfare and right-living.

R. W. CRAIG.

6 Drumsheugh Gardens,
Edinburgh.

The London Letter

(From our own Correspondent)

It was estimated a few years ago that there are probably about a quarter of a million mentally defective persons living outside institutions in England and Wales. Distressing examples of mentally defective children born to mentally defective parents find their way into the daily papers, with the result that there

has been a growing body of opinion calling for sterilization of the unfit and, more especially, the mentally unfit. As is usual when matters reach this stage a committee was appointed, and it has just produced a valuable report on the whole subject. Finding the biological experts who gave evidence at variance on the all-important subject of the mode of transmission of mental defect the committee unanimously and emphatically decided against compulsory sterilization, both on the grounds of lack of unassailable scientific evidence as to its value and of its practicality. As regards voluntary sterilization under proper safeguards the committee recommends that this should be legalized, since heredity undoubtedly plays some part in the production of mental defect and the position of possible "carriers" (on Mendelian lines) of the "factor" is not a happy one. The committee has dealt with many other aspects of the problem, besides setting out definite views on the two all-important questions already mentioned. For example, it shows the idea that sterilization would substantially reduce the number of cases of mental defect now in institutions to be illusory. Another myth to be exploded is that the mentally defective are abnormally fertile; statistics examined by the committee do not support this view. The findings of the committee were unanimous and the way to the legalizing of sterilization would seem to be clear. At present, very few, if any, hospitals in this country would countenance an operation for sterilization for eugenic reasons, and there is some justification for the view held in certain quarters that here is yet another facility open to the rich and denied to the poor.

The introduction of this sort of "class consciousness" argument into medical matters is to be deplored, and there has recently been an unfortunate example, gaining wide publicity in relation to the question of the minimum diet. It will be remembered that the British Medical Association appointed a strong committee to determine the cost of a minimum diet and that the report issued at the end of November recommended 3,400 calories daily and 50 grams of first-class protein per man-standard at a weekly cost of just under six shillings. Even at this figure there were some grounds for criticism, since summer prices were largely used and expert marketing was necessary to secure food at the prices quoted. Politicians in opposition to the policy of the Government were not slow to point out that on the basis of these figures the allowances for unemployed men with families were inadequate when rent, etc., had been paid and the committee's minimum allowance per week for a child at two shillings and sixpence was more than the amount allowed under any assistance scheme. The Ministry of Health plunged into the arena

about six weeks later with a memorandum asserting that its own advisory committee's recommendation of 3,000 calories and 37 grams of first-class protein at a weekly cost of about a shilling less than the British Medical Association's estimate must still be accepted as providing "adequate values for the calculation of sufficient diets". The circular letter stated that this decision was unanimous, but it has since been revealed that at least two members of the committee (out of seven) were either absent or not altogether in favour of the memorandum. The press has been full of expert and pseudo-expert discussion of the problem, and now it is announced that the physiologists of both committees are to meet in an effort to settle the dispute. Meanwhile calories and protein have assumed a political importance.

Hospital finance in this country is often a source of wonder to outside observers who see fancy-dress street collections for certain overcrowded institutions side by side with the steady expansion on modern lines of municipally managed hospitals. Those with first-hand knowledge of the State-aided hospitals in other parts of the world have not this same horror of this arrangement, and it is surprising to learn that recently a member of the board of management of a London hospital was forced to resign because he had publicly expressed the view that sooner or later hospitals will have to accept grants from the State. It is true that despite the financial blizzard of the past few years hospitals have largely managed to come through without serious deficit, and, actually, in the area of the King Edward's Hospital Fund for London there have been more surpluses of income over expenditure than ever before. The annual grant of £300,000 from this fund has, of course, largely contributed to this end, while a very notable feature of the post-war years has been the great increase in the payments made by the patients themselves, either directly or through various associations. It is estimated that in 1932, for every £1 received by the London voluntary hospitals nearly six shillings came in this way, the largest individual share of the income, while public authorities contributed 1s. 4d. for services rendered. On this sort of basis our hospital finance is not quite so absurd as it is sometimes thought to be.

ALAN MONCRIEFF.

London.

"My son, prove thy soul in thy life, and see what is evil for it, and give not that unto it. For all things are not profitable for all men, neither hath every soul pleasure in every thing. Be not insatiable in any luxury, and be not greedy on the things that thou eatest. For in multitude of meats there shall be disease, and surfeiting shall come nigh unto colic. Because of surfeiting many have perished; but he that taketh heed shall prolong his life."—*Ecclesiasticus*.

Letters, Notes and Queries

The Advertising and Sale of Drugs

To the Editor:

Your editorials entitled "The Ethics and Psychology of Advertising", and "Some Food and Drug Acts," which appeared in the February issue of the *Canadian Medical Association Journal*, are timely and to be commended.

The question of advertising in connection with patent medicines is one that presents many difficulties and causes the officials of the Department of Pensions and National Health charged with the administration of the Proprietary or Patent Medicine Act and Food and Drugs Act a great deal of concern. It is not always an easy matter to decide for purpose of prosecution whether or not advertisements are false, exaggerated or misleading, owing to the skilful way in which they are sometimes worded and the wide divergence of opinion as to what constitutes false, exaggerated or misleading statements. I have before me at the moment a preparation that is placed upon the market as a contraceptive; and although it quite obviously contravenes Section 207 of the Criminal Code, the advertisement is so skilfully worded that a prosecution would probably fail.

It is extremely difficult to control newspaper advertising. The more ethical newspapers and magazines will not accept questionable advertisements; others are indifferent and will publish anything whatsoever.

In the field of broadcasts the Department has been exceedingly fortunate. A year ago the Chairman of the Canadian Radio Broadcasting Commission was approached by the Department of Pensions and National Health with the request that all continuities of remedies marketed under the Proprietary or Patent Medicine Act and Food and Drugs Act be submitted to the Department for censorship. At that time the Radio Commission did not have the power to compel proprietors of remedies to submit their broadcasts, but made an attempt to do so which was only partially successful. Since that time regulations of the Radio Commission have been promulgated, and under Sections 90 and 91 thereof the Commission now has authority to oblige all proprietors of remedies marketed under the Proprietary or Patent Medicine Act and Food and Drugs Act to submit their continuities to the Commission.

The Department of Pensions and National Health acts as adviser to the Commission and may censor continuities or recommend that they be prohibited from being broadcast. Recently the Commission issued instructions that all continuities of remedies marketed under the Proprietary or Patent Medicine Act and Food and Drugs Act are to be submitted to the Commission for censorship by the Department of Pensions and National Health.

You make mention of the fact that barbitone is on the schedule, but that other derivatives of barbituric acid are not. A few weeks ago the Department refused to approve the broadcast of a remedy containing one of the barbitone preparations which was recommended as a somnifacient. The Department refuses to accept for registration any preparation containing barbitone or similar preparations that are to be offered for sale as somnifacients, although similar preparations, of which there are a number on the market, may be purchased in any drug store without a prescription. The control of the sale of these preparations, which is becoming widespread, is a matter that merits the consideration of both the Canadian Medical Association and the Canadian Pharmaceutical Association.

With reference to your statement that you are not sure what the jurisdiction of the Advisory Board would be in the case of a preparation that is harmless but useless for the purpose advertised, and in which cheap materials are sold at an exorbitant price, I may advise you that no preparation is permitted to be marketed unless it has some medicinal value for the purpose specified, nor is any preparation permitted to be sold if it is considered that the price is exorbitant. The Department has consistently refused to register patent medicines which have no medicinal value, or for which an exorbitant price is charged.

The competent medical authorities and analyst of the Department carefully supervise all preparations that are marketed under the Proprietary or Patent Medicine Act and Food and Drugs Act. The Department is endeavouring to confine these remedies to simple ailments. Under the Proprietary or Patent Medicine Act remedies are not permitted to be sold for the following medical conditions:—

Alcoholism	Locomotor Ataxia
Appendicitis	Obesity
Arteriosclerosis	Pleurisy
Blood-poisoning	Pneumonia
Bright's Disease	Ruptures
Cancer	Scarlet Fever
Diabetes	Smallpox
Diphtheria	Spinal Meningitis
Dropsy	Tobacco Habit
Epilepsy	Trachoma
Erysipelas	Tuberculosis (Lupus)
Gallstones, Kidney	Tumours
Stones, Bladder Stones	Typhoid Fever
Gangrene	Venereal Diseases
Gastric and Stomach	Remedies for restoring
Ulcers	Sexual Virility
Goitre	Abortifacients
Heart Diseases	Earth Packs containing
High Blood Pressure	medicinal ingredients
Paralysis (Infantile)	Radium Acitivity
Parkinson's Disease	Remedies
(Paralysis Agitans) etc.	Specifics.
Lockjaw (Trismus)	

The above list may be applied to the Food and Drugs Act at an early date.

While neither the Proprietary or Patent Medicine Act or Food and Drugs Act may be perfect, both are generally accepted as being the best of their kind anywhere, and it is pleasing to note that the amended Copeland-Tugwell Bill, which is now before the Senate of the United States, is incorporating many of the features of these Acts. The authorities of Great Britain have been in consultation with the Department of Pensions and National Health, Canada regarding the Proprietary or Patent Medicine Act, which they are using as a basis for the British Act. The question of the inclusion of cosmetics under the Food and Drugs Act has been under consideration for some time.

J. J. HEAGERTY, M.D.,

Chief Executive, Assistant,

Ottawa,

Department of Pensions and

February 15, 1934.

National Health, Canada.

Entamoeba Histolytica

To the Editor:

The articles in the February issue of the *Journal on Entamoeba histolytica* are timely, and they are well emphasized in your editorial. The great difficulty at the present time is diagnosis. It can be made with certainty only by an expert, and, even then, often only under especially favourable circumstances. Before the days of the Wassermann test there was a common saying: "If the diagnosis is doubtful give Potassium Iodide." If spectacular results were obtained the diagnosis of syphilis was definitely made. A similar diagnostic test may be applied in the case of amoebiasis. Emetin administered daily for a week will generally clear up the diagnosis. If the *Entamoeba* is responsible the beneficial results will be unmistakable. Of course it is a drug to be treated with respect, but I think the medical profession should know that it has diagnostic as well as therapeutic value.

GEORGE S. YOUNG.

Toronto,

February 9, 1934.

The Term "Dromedary Onset" of Infantile Paralysis, a Misleading One.

To the Editor:

In 1917 Draper (*J. Am. M. Ass.*, 1917, 21: 1153) described a definite onset noted in some cases of infantile paralysis. There were the first febrile period which lasted for 24 hours, an afebrile period of 8 days (rather longer than usual), and a second febrile period of from 18 to 24 hours. He called this the "dromedary type" of onset because there were two humps in the temperature curve, separated by an afebrile interval, thus resembling the back of a dromedary.

This effort at the introduction of a term

which should at once suggest the exact meaning in a vivid manner is unfortunate, since it is definitely stated by good authorities on comparative anatomy that the dromedary has only one hump on its back. Before presenting the facts on which I base my objections to this term I should like to state that a misconception of the regional anatomy of the dromedary on the part of some observers need not be taken as a detraction in regard to the valuable contributions towards this disease by these observers. Jessup (*Arch. Paediat.*, 1932, 49: 794) is more cautious in his terminology, since he writes of the "camel-back type" of onset, but Stephen (*Med. J. Austral.*, 1933, 1: 60) still uses the expression, the onset by the "dromedary type," in spite of Pepper's correction in 1932 (*Internal Medicine*, Lea & Febiger, Phila., 1932, p. 168).

According to the Oxford Dictionary the dromedary is a light and fleet breed of camel, specially reared and trained for riding, usually of the Arabian or one-humped type of camel, but the Bactrian camel may also be improved into a dromedary. The Dictionary describes the camel as consisting of two distinct species, the Arabian or one-humped, and the Bactrian or two-humped; a lighter and fleetier variety of the former is known as the dromedary. The Encyclopædia Britannica states that the word "dromedary" is applied to swift riding camels of either the Arabian or Bactrian species. However, it describes the camel as the single-humped Arabian *Camelus dromedarius* and the two-humped central Asian *C. bactrianus*. Owen made the distinction clear (*Comparative Anatomy and Physiology of Vertebrates*, Longmans, Green, Lond., 1868, 3: 784); the stores of nutritious matters are piled up in one (*C. dromedarius*) or two (*C. bactrianus*) humps. Flower and Lydekker pointed out the confusion that exists in the use of the names "camel" and "dromedary" (*An Introduction to the Study of Mammals, Living and Extinct*, Adam and Charles Black, Lond. and Edin., 1891, p. 296). They stated that, "It is now generally accepted that the former is the common term for all members of the genus, and that 'dromedary' should be confined to the lighter and swifter breeds of the 'one-humped' species." One of the oldest pictures of the two-humped camel extant, painted on the wall of the Chapter House of Westminster Abbey, has, however, *Dromedary* inscribed under it."

It would be much better to use a more exact term for this type of onset of infantile paralysis, rather than one that, though it be created to appeal to imaginative vividness, nevertheless does create an element of confusion.

DAVID L. KLEIN,
Children's Memorial
Hospital, Montreal.

Nov. 4, 1933

The Teaching of Surgery

To the Editor:

Some very remarkable comments on medical education were made in the *Journal* during 1933, but the most striking one was made at the Round Table of the Canadian Medical Association in 1932, when professors of surgery from McGill, Queen's, Toronto and Western announced that much bad surgery was being done. We hold these professors in the highest esteem, and sympathize with them in their painful confession that they were unable in six years to teach the brightest minds in Canada more than minor surgery. We hope that they will not take it too much to heart, for we all know of some pretty good surgery done by their graduates, and are reminded of a couple of country doctors with an ordinary start who made quite a success at Rochester, Minnesota. The professors think that major operations should be done only by the specially trained few.

The most important thing about surgery is the wisdom of the surgical procedure. Surely with such students and such teachers, with laboratories, hospitals, and lecture rooms, six years should be long enough to give a thorough training in this wisdom and its basic sciences. After a six years' grind they should know what is best to be done, but no doubt would lack, in operating, the skill that can only be acquired by practice. A dear old professor used to say "Surgery can be learned only by surging." An interne may have very few opportunities of operating himself. Operations on the cadaver are useful, but cadavers are hard to get. Much could be learned by operating on laboratory animals. A syllabus of operations could be arranged and supervised by a good teacher that would develop anaesthesia and technique to the 'nth degree. Some years ago the late Dr. Frank Walker, of Detroit, had a private class of this type which turned out some very expert operators.

When our fathers persuaded the legislature to give us the Medical Act they promised to protect the public from incompetence. We license our graduates to practise surgery without limitation, and many of them operate extensively. The lure of pay and prestige is strong. The Medical Council should require candidates to give evidence of skill in operating.

G. R. CRUICKSHANK

Windsor, Ont.,
January 17, 1934.

No one can tell all the reasons why he or she does a thing. Conduct may be dominated by pathological factors which find their way into the mind. Individuals without an adequate goal in life are very likely to reach old age with a sense of dissatisfaction. By the accomplishment of work we attain true happiness.—Dr. Thomas Verner Moore.

Topics of Current Interest

Poisoning by "Dial"

In the light of the case of poisoning by "Dial" recently reported in this *Journal* (1934, 30: 65) by Dr. T. J. Orford, the following is of interest. Clearly, barbituric acid derivatives should be used with care, and their sale to the public, except on a doctor's prescription, should be prohibited.—[Ed.]

We have now received a report from the Clayton Aniline Company, Limited, who have investigated the fate of dial in the body. A dog (25 kilograms) was given 2.5 grams (100 mg. per kilogram) of dial by mouth, a dose which produced death within twenty-four hours. The following quantities of dial were recovered from the corpse: stomach contents, 0.0145 gram; urine, 0.0734 gram; blood, 0.0125 gram; liver, 0.0021 gram; kidney, 0.007 gram; brain, 0.0044 gram; total, 0.1134 gram. The total amount recovered was somewhat less than 5 per cent of the dose administered, but from the point of view of the toxicologist it is important to note that more than half of the amount recovered was found in the urine and that a demonstrable quantity was recovered from the stomach contents, although the latter were not analyzed until fourteen days after death. A control experiment was made on another dog (19 kilograms), to which 7.6 grams veronal (diethyl barbituric acid) were given. In this case 1.06 grams were recovered from the urine and 0.082 gram from the stomach contents. Reiche and Halberkann (*Münch. med. Wchnschr.*, 1929, 76: 235) analyzed the urinary excretion of dial in patients who were taking doses varying from 0.1 to 0.4 gram daily. Patients who received for several days a daily dose of about 0.2 gram of the drug excreted about 0.05 gram daily in the urine, and on cessation of the administration of the drug the excretion continued and took five to six days to fall to 0.01 gram. About 30 per cent of the dose administered was recovered from the urine. These results agree with many other investigations that have been made on the fate of barbituric derivatives in the body. As a class these drugs are excreted slowly, and, even in the case of compounds that are detoxicated rapidly in the body, barbituric acid derivatives are excreted for several days after the administration of the drug. The results mentioned show clearly that in the case of a patient poisoned by dial it should be possible to identify the drug in the urine several days after it has been taken.—*Brit. M. J.*, 1933, 2: 1178.

Vitamins and All That

No one can have failed to observe that advertising during the past ten years has enormously increased in extent and ingenuity. A rather less striking but equally noteworthy change has been an enlargement of its scope, particularly in what may be called a semi-medical direction. We are still, of course, plagued with the most fraudulent and audacious patent medicine advertising of any civilized country, but for that we have only imperfection of our laws to thank; there is little new in this except a prompt exploitation of the latest orthodox medical discoveries or fashions. What is new, at least on its present scale, is the anxiety of the great world of commerce to safeguard our health; the "preventive ideal" seems almost to have made greater strides in Mincing Lane than in Whitehall. In a few instances this has involved breaking new ground: "Feminine hygiene", for instance, would have been considered too indelicate a subject for public advertising until recent years (it may be remarked here that the attempt now being made to persuade ignorant and perfectly healthy women and girls to douche themselves is grossly unscrupulous); the recent onslaught on "halitosis" and pyorrhœa is another new line which has been pursued in a peculiarly insidious and disgusting way. But in the main this health campaign has consisted rather in claiming medical virtues for products of other kinds, usually foods or drinks. This is evidently a consequence of increasingly fierce competition, the manufacturer being able to make headway only by claiming for his product some new property which is really outside its sphere, all the capital in popularity which can be made of its legitimate advantages being exhausted. This movement has quite recently attained such proportions that it must either greatly mislead and confuse the public, or stultify itself by its sheer profusion and absurdity, or by mutual contradiction. A brief examination of its main features may be of some interest.

To point to the origins of this form of propaganda is no easy matter. They are probably to be found more than anywhere else in the miserable process of degradation which has afflicted our bread. The almost tasteless substance which goes by this name nowadays is prepared from flour which, for reasons known only to millers, consists of very little but starch. Hence it became profitable to market flours for which it was claimed that the constituents removed or destroyed by the new processes of milling and bleaching were retained, or even added to; the eventual result is a welter of proprietary breads all claiming peculiar nutritive and health-giving properties. The same early era saw the rise of "breakfast foods"; anyone who has not observed for him-

self the obsessional state which can be produced by reading the literature of these products may read of it to his profit and amusement in "Saki's" story, *Filboid Stodge*. The advertising of such products was also satirized admirably by H. G. Wells in *Tono-Bungay*; a large hoarding in an otherwise attractive spot bore a placard in the following terms:

"Why are birds so bright?
Because they digest their food properly.
Why do they digest their food properly?
Because they have a gizzard.
Why hasn't Man a gizzard?
Because he can buy PONDEREVO'S FRIABLE
TRITURATED BISCUITS, which are better."

It is in this sphere more than in any other that the discovery of vitamins has been such a god-send to the enterprising manufacturer; the first tentative use of the vitamin stunt in publicity, when the general public was hardly aware that such things existed, has swollen now to an almost deafening chorus. It need hardly be said here (a) that the average sensible mixed diet contains adequate amounts of all the known vitamins; (b) that an attempt to compensate for a deficiency of any one of them in a poor diet can only be made with expert knowledge; (c) that there is at least one extremely grave condition produced by excessive vitamin consumption, and although this is not likely to occur accidentally, it is by no means unlikely that moderate unbalanced overdosage may have deleterious effects at present unidentified. This is perhaps taking these things rather too seriously; with the exception of certain yeast preparations most patent foods probably contain no more vitamins than ordinary natural foods.

Another landmark was the "Eat more" slogan. It began with fruit, and extended itself to fish, bread and milk. One almost hoped for a good honest counterblast, quite regardless of the interests of mere health, such as "DRINK MORE BEER". It has come. Yet the interests of health are still invoked. First, the hoardings were black with glasses accompanied by an announcement that the beverage they contained "is good for you". A paler rival, not to be outdone, has been publishing long and reasoned statements of the why and wherefore of its health-giving virtues. Its malt and yeast are all that is required to promote perfect health (but is there any actual yeast or vitamin B in beer?); it assists digestion, fortifies the system and increases its resistance to disease; it stimulates the body to action, yet never dulls the brain (the dosage of which this is true should surely be specified); it also contains water, which is good for the stomach and liver (so does the domestic tap). Well, most of us will concede that beer has its virtues, but we had evidently not recognized by any means all of them. Most people would find it hard to furnish a good medical reason for drinking gin (unless as a diuretic), but we are told that it "keeps you slim".

Doubtless this is true, under certain conditions of dosage, until the advent of ascites, when the figure is apt to deteriorate.

Successive epidemics of influenza, and in particular the last, have furnished an exceptional opportunity for ebullitions of this kind. Everything conceivable has claimed the power of protecting against this disease; meat extracts, breads, meat, milk, beer, rum, whisky, fruit and various vitamin foods are only some of them. In advertisements to be seen in profusion not far from the Hospital we were assured that three rashers of bacon (provided that they came from a certain country), eaten daily for breakfast, conferred immunity. A placard appeared in fruiterers' windows which kills two birds with one stone:

"What keeps you slim and safeguards you from 'flu?
THE ANSWER'S A LEMON."

It certainly is, but they don't mean it that way. This announcement has gone with the influenza, and has been succeeded by another of considerable interest to the Eye Department:

"When spots arise before your eyes
EAT MORE FRUIT."

Among other symptoms of this disease of publicity are the efforts to persuade you that beverages somewhat resembling cocoa promote the digestion of other foods, furnish necessary vitamins, or act as sedatives, and, to take a less prominent, but perhaps more astonishing example, the claim that adding a certain relish to your diet will assist you in slimming. Tea occasionally claims positive virtues which should leave you incredulous; more often it contents itself, in the company of coffee and tobacco, with the suggestion that its harmful ingredients have been removed; you may be sure that if they really have it will be very dull stuff. Although strictly this is an effort of a different kind—a patent medicine masquerading as a food, instead of the reverse—mention must be made of an advertising campaign now in full blast to "put over" a laxative chocolate. This product contains phenolphthalein, by no means as "gentle" and beneficent a drug as you are led to believe, and the property of tastelessness, which doubtless dictated its choice, is a two-edged weapon. What is to prevent a child from eating a whole box, and what may happen if it does? A temporary effacement by purging may seem perhaps appropriate, if rather severe punishment, but the result recorded by Cleaves (*J. Am. M. Ass.*, 1932, 99: 654), who was enabled to study at autopsy the features of phenolphthalein poisoning in a previously healthy boy of 10, is another thing altogether. There could not be a better example of the abominable results which may follow when one trade tries to appropriate the selling advantages of another; in this case the better the chocolate

the worse for the unsuspecting child who will consequently go on eating it.

If we are to accept the evidence of present-day advertisements, it would appear to have been decided at endless meetings of directors, or in the sanctums of most publicity experts, that foods and drinks must have a health feature among their selling points, and a choice is presumably made from the following more or less according to the general properties of the product:

1. It slims.
2. It is "body-building".
3. It confers refreshing sleep.
4. It wakes you up.
5. It is easily digestible.
6. It assists the digestion of other food.
7. It is full of vitamins.
8. It is free from all sorts of things which it need not contain.
9. It regulates your bowels.
10. It confers protection against various ailments (influenza especially, when in season).
11. It improves your complexion (or brightens your eyes).
12. It lengthens your life.

Is there a man or woman who can altogether resist these blandishments? Yet what of him who falls for them all? He must "eat more" of almost everything, and specifically consume certain forms of bacon, bread and beer, take gin for his figure, "X" for his complexion, "Y" for his nerves, "Z" for roughage in his bowels, and a hot and much too nourishing drink of Whatnot before he goes to sleep. Over his tomb one might write:

"Here lies a Man who Did what he was Told."

It is difficult for anyone not in practice fully to appreciate the effects of public inquisitiveness about medical matters, and of the superficial acquaintance with them which is certainly becoming almost universal. It must lead sometimes to very awkward, if not unanswerable, questions, and the number of times that Dr. B flatly, though innocently, contradicts the advice or opinions of Dr. A must be increasing daily, usually with the consequence that the profession is said not to know its job. In the sphere of dietetics this is unfortunately not far from the truth. Doctors ought to know more about the science of nutrition, or, to put it on a broader basis, about how to keep people well. Apart from thus putting themselves in a position to overrule all the miscellaneous advice of laymen, their only hope of preventing a serious usurpation of their functions is to persuade their patients to believe nothing which they see in print—a policy which on all grounds has a good deal to recommend it.—*St. Bartholomew's Hosp. J.*, 1933, p. 143.

Abstracts from Current Literature

Medicine

The Unity of Gastric Disorders. Hurst, A. F., *Brit. M. J.*, 1933, 2: 89.

The author develops the thesis that the main organic disorders of the stomach ultimately depend on the same exciting causes, which are so widespread in their incidence that few can escape them. The anatomy and physiology of the stomach in about 80 per cent of persons is such, however, that they can successfully resist these exciting factors; the remaining 20 per cent will sooner or later develop some organic gastric disease. Approximately half of this minority are born with the "hypersthenic gastric constitution", showing hyperchlorhydria and short, high, rapidly-emptying stomachs, while the remainder show the "hyposthenic gastric constitution"—having hypochlorhydria and long, low, slowly-emptying stomachs. Both these conditions are strongly familial, and are compatible with perfect health for long periods. In addition, about 3 per cent of people are born with complete achylia gastrica—an inborn, familial, error of secretion.

Gastric disorders may be caused by mechanical, chemical and thermal irritants, by infection, or by hæmatogenous irritants. The mouth is a first line of defence against the first group of irritants, but most people do not use the teeth properly to protect the stomach from insults. Amongst the most potent irritants are alcohol (taken on an empty stomach), strong tea, coffee, condiments, spices, excess "roughage", and tobacco juice in heavy smokers. Any drugs, whether taken needlessly for constipation, etc., or for chronic disease, are of course irritant. Gastritis, often symptomless, is constant after gastro-jejunostomy or partial gastrectomy, owing to the irritant nature of the upper intestinal contents.

The stomach itself acts as a second line of defence for protecting the small intestine from irritation; in the process it, especially the pyloric end, is often injured. In the 80 per cent of "normals" gastric irritation is minimal; in the hyperchlorhydries there is ample protection when the stomach is full, but it empties rapidly and is then susceptible to irritants, as alcohol, tobacco and drugs. In the 10 per cent with hypochlorhydria, the second line of defence is deficient; gastritis inevitably develops and finally complete achlorhydria. Excess mucus is secreted in these cases, an ineffectual attempt at self-protection. Infected material from teeth, tonsils, pharynx and sinuses may produce a streptococcal gastritis in the hypochlorhydric stomachs, especially if, as in the atrophic stage of gastritis, even the secretion of mucus has become deficient. Hæmatogenous

gastritis occurs in acute infections, uræmia, severe burns, etc. Such an acute gastritis will develop in any type of stomach but is only likely to become chronic in predisposed individuals.

The functional efficiency of an organ is always reduced by inflammation; in acute gastritis, no gastric juice is produced; the amount in chronic gastritis varies greatly, while the amount of free acid present depends on the type of the individual. Even hypersthenic individuals may have achlorhydria with severe gastritis. Gastritis is always an accompaniment of ulcer and after its medical treatment the acidity of the juice is always found higher.

While hyperchlorhydria is primarily a protection, if even slight gastritis develops the excess acidity will aggravate it. Gastritis in hyperchlorhydric individuals is very likely to be associated with erosions, which may develop into acute ulcers and finally become chronic. These ulcers develop in the duodenal cap in short, high stomachs, and in the pyloric end of the stomach in the long, slowly emptying type. In the latter, too, the gastritis is more severe and the acidity therefore lower or absent.

The gastritis which invariably develops in hypochlorhydric stomachs may be symptomless, or may produce nausea and other digestive symptoms; achlorhydria always results. Duodenitis and enteritis is frequent. Cholecystitis may arise from ascending *B. coli* infection. These persons are more susceptible to typhoid, dysentery and cholera than normally. The toxæmia following intestinal infection is an important factor in 25 per cent of rheumatoid arthritis cases, and also in some cases of asthma, eczema, etc.

The author believes that carcinoma never develops in a normal stomach. Thirty-five per cent of cases are due to malignant change in chronic ulcer, and in these free acid is found; 65 per cent of cases are the result of malignant degeneration in the mucosa in chronic gastritis cases, with achlorhydria. Carcinoma and Addison's anæmia are sometimes found associated, which is not surprising. The number of cases of anæmia which develop carcinoma will increase under modern therapy, unless the concomitant gastritis is treated at the same time.

W. FORD CONNELL

The Use of Iodine Compounds in the Treatment of Thyroid Disease. Gardiner-Hill, H., *Proc. Royal Soc. Med.*, 1933, 26: 875.

The uses of iodine in the treatment of simple and of toxic goitres are discussed. In the London area, most of the simple goitres seen are sporadic and a large proportion develop during puberty, pregnancy, lactation, or at the climacteric. In some, the condition arises after an infective illness. While goitre may be diffuse or nodular, the author feels, with

Hertzler and others, that the nodular is merely a late stage of the diffuse, in which repeated hypertrophies, and finally fibrosis have occurred. Diffuse glands enlarge during puberty, pregnancy, lactation and after infective illness; after surgical removal, the remaining part hypertrophies. Nodular goitres do not so behave, probably because fibrosis has occurred. Iodine has little effect on the nodular type, but may be used prophylactically, to prevent further enlargement; caution is necessary, however, as thyrotoxicosis may develop. Patients with long-standing nodular goitres often develop hypothyroid symptoms, necessitating thyroid extract treatment. If iodine is exhibited within six months of the onset of a diffuse goitre, the goitre will probably disappear. Later, iodine will at least prevent further hypertrophy. In endemic areas, iodine prophylaxis is now generally agreed to be invaluable.

"Primary and secondary Graves' disease" are the terms used by the author for exophthalmic goitre and toxic adenoma respectively, since this nomenclature has now won fairly general recognition, clinically, in England. By the first term is meant the cases in which the goitre, exophthalmos and thyrotoxic symptoms develop more or less about the same time; in secondary Graves' disease, the thyrotoxic symptoms develop after some years, in a simple goitre.

While Belgian workers, again, report beneficial results with iodine therapy in secondary Graves' disease—toxic adenoma—the majority of workers are agreed that iodine in this group of cases is largely contraindicated. The author analyzes 105 cases of his own, 102 in females and 3 in males. Of these "toxic adenomas", 66 were of the diffuse type and 39 were nodular. Usually the goitre had been present for a much shorter period before the development of thyrotoxic symptoms in the diffuse than in the nodular cases. The author feels that the frequency of the occurrence of secondary thyrotoxicæmia in diffuse goitre is not widely enough recognized. In 35 per cent of the cases, some infection, in 33 per cent some psychological shock or anxiety, and in 7 per cent the administration of thyroid extract, could be considered responsible for the onset of symptoms. The diffuse group are a difficult therapeutic problem, for they appear to be resistant to most forms of treatment. Iodine, at least, never appears to produce an exacerbation of symptoms. The most satisfactory results have been obtained by a combination of iodine therapy with periodic doses of x-rays. Surgery is not successful, as the remaining gland hypertrophies and the symptoms continue. The nodular goitres of secondary Graves' disease are mostly intolerant to iodine, but do well when treated surgically.

The author feels that the degree the gland hardens as the result of iodine therapy is definitely related to the amount of clinical improvement. He considers that the thesis—that the beneficial results of iodine may be due to purely mechanical causes—to distension of the vesicles with colloid, leading to pressure on surrounding blood vessels and secreting tissues—is worthy of full consideration.

W. FORD CONNELL

The Corroborative Value of an Improved Gastro-duodenal Braid in the Diagnosis of Peptic Ulcer. Lipschutz, E. W., *Am. J. M. Sc.*, 1933, 186: 79.

The presence of a blood stain on a piece of silk braid left in the stomach over night is a valuable method of determining the presence of an ulceration in the stomach or duodenum. The technique consists in having the patient swallow a piece of loosely knitted tubular silk braid, one-half inch in diameter and thirteen inches in length, to which is attached a retaining cord seventeen inches long. The silk braid remains in the gastro-intestinal tract over night and is withdrawn in the morning. Should ulcer be present a localized blood stain, easily recognized, will occur on the braid. Its position on the braid determines where the ulcer is located, as the pylorus is indicated by a distinctly compressed area. In carcinoma the stain is not localized but diffuse. Lipschutz has studied 100 cases thoroughly investigated clinically and by roentgen ray. Thirty-two of the cases showed ulcer in the x-ray investigation. Seventy-five per cent of these showed staining of the braid, whereas only 62.5 per cent of the histories were suggestive of peptic ulcer. In two cases, where x-ray showed no evidence of ulcer, the braid test was positive, and the presence of ulcer was subsequently confirmed at operation, while in two others the x-ray was positive and the braid test showed no blood.

The braid test is also of value in determining duodenal stasis. When this is present the duodenal end of the braid is returned deeply stained by bile. The author considers the test of considerable value as an adjunct in the diagnosis of peptic ulcer.

E. S. MILLS

Surgery

Primary Thrombosis of the Axillary Vein.

Ross, J. C., *Brit. M. J.*, 1933, 2: 525.

This condition, though rare, is easily recognized. The characteristics, primary, because no obvious cause is present, are as follows: (1) the right arm of a healthy male is affected; (2) the age-period is from 20 to 30; (3) the immediate history nearly always includes recent trauma, or some exceptional effort, with the arm in an abducted position; (4) the affected arm is swollen from the fingers to the

level of the base of the axilla; (5) the swelling is general, regular, and does not pit on pressure; (6) the skin is slightly cyanosed; (7) dilatation of the superficial veins can be seen over the pectoral region and the antero-lateral chest wall; (8) a firm tender cord is palpable in the vicinity of the axillary vein; (9) pain and tenderness are usually present; (10) there is no pyrexia or constitutional disturbance. The treatment consists in rest and elevation of the arm. Later gentle massage may be used. Embolism occurred in one reported case. In this case exploration was carried out and the thrombus removed. The prognosis is good. Complete function with subsidence of the swelling occurs within periods varying from two weeks to several months. Operative interference is unnecessary and dangerous. Aching pain and oedema after marked effort may persist for some time. The author reports a case in which the swelling developed while the patient was asleep.

The causation of the condition has aroused much interest. Trauma and strain can be excluded from very few of the recorded cases. Various theories have been advanced, but in those cases in which trauma can be ruled out the cause is still unsolved.

STUART GORDON

Carotid Ligation for Intracranial Arteriovenous Aneurysm. Keegan, J. J., *Surg., Gyn. & Obst.*, 1933, 52: 368.

Intracranial arteriovenous aneurysms are of two types, developmental and accidental. The former involve the blood-vessels of the brain, while the latter are limited to carotid-cavernous sinus fistula. The treatment of both types is limited to palliative measures—carotid ligation and x-ray. The presence of an arteriovenous fistula constitutes a powerful stimulus to the development of a collateral circulation, even greater than arterial occlusion. On this account ligation should be postponed at least a few months until compensatory dilatation has had a chance to develop. Compression of the common carotid artery enables one to detect inadequate anastomotic cerebral circulation on that side by the occasional production of syncope or paralysis from cerebral anæmia. In such a case a prolonged course of compression with increasing frequency and duration serves to increase the margin of safety in ligation, and may by itself result in a cure or marked improvement. The chief danger in carotid ligation is an ascending thrombosis which reaches and occludes the middle cerebral artery. Symptoms of this complication develop slowly within twelve to twenty-four hours. Common carotid ligation leaves a greater margin of safety, but may be inadequate. Later ligation of the internal carotid is probably safer than as a primary procedure.

FRANK A. TURNBULL

Tuberculosis of the Flat Bones of the Vault of the Skull. Straus, D. C., *Surg., Gyn. & Obst.*, 1933, 52: 384.

This condition is uncommon but not rare. The infection usually reaches the skull through the blood stream and localizes in the vascular cancellous bone of the diploe. It occurs most frequently in early childhood, and one-half of the cases occur before the twentieth year. As a rule attention is not drawn to the condition until a swelling appears. Headache is rare, but if it occurs is frequently local and associated with local tenderness. In early cases the swelling is due to a subperiosteal abscess—at this stage a round firm mass fixed to the bone. Later the periosteum is perforated and a large fluctuant mass appears. While this latter mass is soft in the centre, the margins are firmly attached to the bone at the base, in this resembling a cephalhæmatoma. Still later the skin becomes adherent and finally perforates. Roentgenograms usually show one or more circumscribed punched-out looking defects in the bone. Gumma of the vault simulates this condition most closely. Severe pain at night, a tendency to necrotic destruction of the scalp, without much pus, and a moth-eaten appearance of the skull in the x-ray are characteristic of syphilis.

If the general condition of the patient is good, and the tuberculous cranial lesion is circumscribed the outlook is very favourable. The only proper treatment is radical surgical removal of all diseased tissues. If possible the cold abscess is excised like a tumour. The area of perforated bone is excised by cutting away a circular disc. Granulations are curetted off the dura and this latter swabbed with tincture of iodine and dusted with iodoform powder. The wound is closed without drainage. Primary union can usually be anticipated.

FRANK A. TURNBULL

Obstetrics and Gynecology

Recent Advances in the Study of Etiology and Treatment of Eclampsia Gravidarum. Hofbauer, J., *Am. J. Obst. & Gyn.*, 1933, 26: 311.

Study of the bilirubin excretory power of the liver by the V. Bergman method shows that, if retention after four hours of 10 per cent or more of the synthetic bilirubin injected intravenously is accepted as signifying definite liver damage, 40 per cent of all pregnant women in the second half of pregnancy sustain actual functional deficiency of the liver. At all periods of pregnancy varying amounts of syncytial buds, fetal ectoderm, are constantly being cast off from the large surface of the chorionic villi, whose exposed surfaces equal at term 6.5 square metres. Such syncytial substances break down in the maternal blood. The

pregnant organism should be viewed, therefore, as being under the constant influence of blood foreign proteins. It has been shown that prolonged injections of foreign proteins lead to impairment of liver function and glycogen deficiency. These fetal proteins serve as messengers to the anterior pituitary, thyroid and cortex of the adrenals which respond to this stimulation by hyperplasia and hypertrophy. The increased permeability of the capillaries during the last few weeks of pregnancy is also traceable to placental protein split products. Impairment of liver function and altered physiology of the capillaries may interfere with the marked ability of the liver to destroy or inactivate highly toxic alkaloids and, by inference, potent hormones derived from the posterior pituitary, thyroid and adrenals.

The striking similarity between the cardinal features of blood chemistry in eclampsia and those of experimental hyperpituitarism is too obvious to be ignored. In both conditions hyperglycæmia, increase in lactic acid and inorganic phosphates, and considerable lowering of the CO₂-combining power of the blood are found. Recent experimental studies show that pituitary extracts interfere in some unknown manner with the utilization of oxygen by the tissues. The researches of Manhart have shown that in eclamptic women the venous blood is characterized by a reduction of its carbon-dioxide content. According to Rodenacker, decrease of the oxidative power of the tissues to the level of internal asphyxia represents the determining factor in eclampsia.

The readiness to constriction of the arterioles as a response to the pressor principle of the pituitary is enhanced by the presence in the blood of eclamptics of an excess of the thyroid hormone. In unanæsthetized dogs pituitary extract produces constriction of the coronary arteries and inhibits oxidative processes in the myocardium as well as skeletal muscles. Pre-cordial pain, a significant clinical symptom in pre-eclamptic conditions, is referable to spasmodic contractions of the coronary arteries. Degenerative changes of the myocardium and dilatation of the heart, known to occur after eclamptic attacks entail grave danger, particularly in individuals affected with hypoplasia of the heart. J. Young, of Edinburgh, reports the persistence of raised blood pressure, dilatation of the heart and degenerative changes of the myocardium.

The antidiuretic effect of the posterior pituitary hormone, oxygen-lack, and decreased blood flow through the kidney as the result of angiospasm, account for the diminished urinary output and the occurrence of degenerative changes in the renal parenchyma of eclamptic patients.

In the brain the arteries respond to the sudden elevation of blood pressure by con-

striction which produces cerebral anæmia. Oxygen starvation excites the flow of adrenalin into the blood current and, also, rapidly increases the permeability of the capillary walls, thus favouring perivascular exudation, œdema of the brain and increased intracranial pressure. The retina gives the obstetrician objective information as to the condition of the systemic arterioles, and more particularly the state of the cerebral arterioles.

Considering that the serious manifestations of eclampsia have their origin in (a) derangement of oxidative processes, (b) derangement of water metabolism culminating in cerebral œdema, and (c) effects of vasospasm in vital organs, the practical aim to be approximated in treatment is to counteract and relieve these phenomena, to destroy if possible the hormonal principles involved, or to counterbalance their action, and to maintain or increase the reduced of vital organs. Measures suggested are the administration of 250 c.c. of a 20 per cent solution of glucose following the withdrawal of 300 to 350 c.c. of blood, the procedure to be repeated at six-hours' intervals if necessary; the routine administration to eclamptics and pre-eclamptics of alkali, application of ultraviolet rays for the relief of hypertension and vasospasm, the liberal administration of oxygen to eclamptics, the exhibition of sedatives (morphine, chloral hydrate, luminal, magnesium sulphate) which control the posterior pituitary effects, and, lastly, delivery with the least possible violence.

ROSS MITCHELL

Urology

Excretion Urography with Neoskiodan. Moore, T. D., *J. Urol.*, 1933, 30: i.

The physical and chemical qualities of neoskiodan and the results of its use in 50 clinical cases are presented. The writer is strongly in favour of having the patient omit supper and breakfast and abstain from fluid for 12 hours prior to the injection. The injection itself is entirely painless, a distinct advantage over other contrast media. It is best injected slowly with a small needle. No patients showed evidence of irritation of the vein. Two were slightly nauseated, one complained of warmth, one showed symptoms of coryza, and only one showed a marked reaction manifested by stridor, cyanosis and a feeling of general warmth. The symptoms promptly disappeared after injecting epinephrin.

Following injection a small rubber ball is placed under a binder and snug compression applied over a localized area above the symphysis, to cause pressure on the lower ureters. The writer is very emphatic about the advantage of compression for the first picture at

least; after that it may be left off so the normal filling and emptying ratio will not be disturbed. Renal function should first be determined, and if it is normal the first film is exposed after a fifteen minute interval and the second ten minutes later. In 20 cases the first film was best and in 26 cases the second was best. If there is much renal damage considerably more time is necessary.

It was possible to make a definite diagnosis in cases of congenital defects, stone, tumour, and stricture, but sometimes cystoscopy was also necessary, particularly in cases of extensive renal damage and cases with bladder lesions.

N. E. BERRY

Diphtheritic Urethritis. Berry, N. E., *J. of Urol.*, 1933, 30: 263.

A review of the literature is presented showing the condition to be exceedingly rare. The case presented is that of a man of 45 who complained of frequent painful urination. Examination showed a swollen meatus indurated and everted and covered with a greyish-yellow membrane. The patient became quite sick and developed a large peri-urethral abscess. The diagnosis was not made at first, but the very dense adherent nature of the membrane suggested its diphtheritic nature, and this was confirmed by culture. It was not however a virulent strain. The condition responded promptly to the administration of antitoxin. The patient was well for a year when the identical symptoms again appeared. On this occasion there was no response to the administration of antitoxin until heroic doses were tried; the patient then got well. Active immunization was then carried out and the disease did not recur. The origin of the infection was not determined.

V. J. BERRY

Ophthalmology

Premonitory Lid Œdema in the Typhoid Group. Beach, S. J., *Am. J. Ophth.*, 1933, 16: 119.

There is a tradition that œdema of the eyelid occurs as a manifestation of typhoid fever. Some observers dismiss the notion as not worth notice. Therefore Beach having observed the phenomenon in two interesting cases reports them. The cases and the description of the epidemic alike indicate that œdema may be the earliest symptom of the disease and therefore highly important as regards diagnosis. There is a soft painless non-inflammatory bilateral swelling, extending to adjacent parts of the cheeks and forehead, which lasts only a few days. In these instances the swelling has disappeared before any evidence suggestive of

typhoid has appeared—in fact before the patient has felt ill. Pyrexia has always been present.

The first case was of a woman, 22 years of age, who had had a few days of painless swelling of the lids and cheeks. This was worse in the morning and on the right side. Examination revealed a symmetrical swelling of the lower lid, extending on the cheeks below the zygoma. There was no tenderness or redness. There was no disturbance of the urine, parotid, tear passages, nose, throat or teeth. Two days later the temperature was 101° , pulse 96, and there was some lassitude. The Widal test was negative. Subsequently the spleen became enlarged and the para-typhoid agglutination test was positive. Gradual recovery took place in four weeks.

S. HANFORD MCKEE

Melanotic Sarcoma Developing on a Pterygium.

Marin-Amat, M., *Ann. d'Ocul.*, 1932, 169: 885.

Development of sarcoma on a pterygium is very rare, and some cases published as such do not bear out this diagnosis. The case reported is a male, aged 43 years, married, a stone-cutter, who came under observation in May, 1932, when he complained that he had a small internal pterygium in both eyes which had occasionally given him some discomfort. Four years previously he had been hit in the right eye with a small piece of stone which had inflamed the eye slightly for some three or four days. About a year later, a small dark point appeared in the pterygium of the eye that had been injured. This dark area increased gradually as a small excrescence which prevented proper closing of the lids. Examination showed the left eye to be normal except for a small pterygium. In the right eye one saw a large excrescence which occupied the internal angle between the lids and prevented their closure. With more minute examination and separation of the lids, one saw a large internal pterygium with a wide base which extended into the cornea for about 1 mm. The dark colour of the surface was confined to the central area; the periphery kept its characteristic red colour. In the centre of the pterygium was seen this black tumour mass, cylindrical in shape, which reposed between the lids. A clinical diagnosis was made of sarcomatous degeneration of the melanotic type of a pterygium of the right eye. A piece was now excised for microscopic examination, and treatment with radium undertaken. Complete cure of the neoplasm *in situ* resulted, and persistence of the normal pterygium tissue which was not affected by the radium. The eye itself was not affected. There exists some doubt that perhaps metastasis in other parts will ultimately render ineffectual the marvellous results obtained with radium.

S. HANFORD MCKEE

Neurology and Psychiatry

Mental Hygiene in General Hospital. Heldt, T. J., *Mental Hygiene*, 1933, 17: 209.

The author traces the developments in attitude towards mentally disturbed patients through the primitive belief in demoniacal possession, punitive methods, then the epochal change to compassion and pity. He suggests emphatically that it is now time that mere sentimental compassion be reinforced, if not replaced, by tolerance and understanding. He points out the rather startling fact that only 63 out of 4,302 general hospitals in the United States have any provision for mental patients, no matter how mild the case may be.

He then presents various cases where psychiatric contacts were of considerable value in general medical and surgical cases, using Alter's convenient classification into (1) Vorsorge—pre-care. (2) Fursorge—care. (3) Nachsorge—after care. In the first group he shows two cases, one in which a distinctly psychopathic personality was persuaded to undergo an essential but previously refused operation. The other, a capable wage earner, albeit unstable, who on the discovery of a surgical condition entered into an acute mental upset, which it is suggested might have been avoided by a better psychological approach to that particular patient. Other cases are presented where the patients with mental symptoms profited greatly by expert medical and surgical investigation which would have been impossible had they been committed direct to a mental institution. In the third group the author presents cases in which psychiatric care following various procedures aided in averting prolongation of convalescence through the inculcation of healthier mental attitudes. In conclusion he pleads for the dissemination of an attitude of tolerance and scientific interest towards mental patients, and stresses the importance of thorough neuropsychiatric training for all practitioners, regardless of their particular line of work.

G. N. PATERSON-SMYTH

Sanity in Mental Hygiene. Myerson, A., *Mental Hygiene*, 1933, 17: 218.

In an entertaining and rather original fashion the author makes a plea for moderation in the claims of the modern psychiatric school. He feels that mental hygiene and psychiatry in general have claimed too much for themselves. Holding that there is a condition, "social hypochondriasis", which results from the teaching of anything regarding health, and taking as an example some of the extreme claims made by dietetic enthusiasts alluding specifically to what he calls "the great spinach question," the author compares with this various exaggerated statements made by mental hygienists regard-

ing certain childhood traits—thumb-sucking, day-dreaming, etc. Pointing out how in all these examples cited there is a basic valuable truth, but that there is a regrettable tendency to exaggerate their importance and to expand their application unjustifiably. In concluding he says, "Mental Hygiene must not become propaganda, but must have the objectivity of science. It must carry on research, the first step in which is to draw a clear distinction between what we know and what we hope to know.

G. N. PATERSON-SMYTH

Dermatology

Occupational Diseases of the Skin. Bridge, J. C., *Brit. M. J.*, 1933, 2: 324.

Occupational diseases of the skin may roughly be divided into two great groups: "dermatitis and ulceration due to dust and liquids" and diseases due to specific causes, as chrome ulceration, anthrax, etc. The author lists 32 classes of workers as specially liable to occupational dermatitis. Amongst these are dyers and calico workers, engineers, labourers, metal platers and polishers, bakers and confectioners, painters, leather workers, rubber workers, etc. Of the identified causative agents, alkalis are most important; sugar, oil, chrome, turpentine, dyes, friction and heat are all prominent factors.

There are few, if any, substances used in industry, however, that will not, in certain individuals, produce a condition which can be classed as dermatitis. Injury to the skin, especially friction, is considered an important primary factor. Prevention lies in securing an intact skin. It is obviously inconsistent with this principle to employ anyone whose skin shows abnormality. In some industries, moist greasy skins seem most susceptible, in others, harsh dry skins. A periodic examination of the exposed parts of the skin is recommended, in addition to the preliminary examination of workers before employment. Prophylactic measures include gloves, if these are practicable. When the skin is exposed to a defatting agent, as turpentine or spirit, an emollient used freely is invaluable. Suitable washing accommodation is most essential. Oil, especially lubricating oil, is very liable to produce an acneform condition of the skin, due to blocking of the hair follicles with grease and dirt. Dakin's solution used prior to work and before washing, is excellent.

Chrome ulceration, one of the specific skin affections, is characterized by typical "punched-out" skin ulcers; it is becoming important with the increase in the practice of chromium plating. Epitheliomatous ulceration of the skin due to pitch, tar, mineral oil, paraffin, bitumen or any compound, product or residue of these

substances, causes a greater number of fatalities than any other notifiable industrial disease. Early detection and treatment, preferably with radon, is essential.

Anthrax is an uncommon industrial disease. No practical method of disinfecting hides or skins has ever been devised, although a sulphur-lime process reduces the infectivity. The early use of Sclavo's serum in treatment has greatly reduced the mortality.

W. FORD CONNELL

Celery Itch—Dermatitis due to Celery in Vegetable Canning. Henry, S. A., *Brit. J. Dermat. & Syph.*, 1933, 45: 301.

The author is a medical inspector of factories and has had abundant opportunity of observing the appearance and course of occupational dermatitis.

A critical study is made of the cases of skin eruption in three different factories, apparently caused by contact with celery. There is also a discussion of the chemistry of the essential oils contained in celery, and it is suggested that limonene or its derivatives is the offender. Prevention of a recurrence of the eruption was obtained by either transferring the patient to other types of work or by the liberal application of pure liquid paraffin to the exposed parts previous to contact with the celery.

NORMAN M. WRONG

Therapeutics

Therapeutic Application of Acidophilus Milk in Simple Constipation. Weinstein, L., Weiss, J. E., Rettger, L. F., Levy, M. N., *Arch. of Int. Med.*, 1933, 52: 384.

B. acidophilus constitutes the bulk of the intestinal flora of breast-fed infants. Its growth is stimulated by lactose or dextrin orally. It will survive oral administration itself and is entirely harmless. Previous attempts to use this agent, although somewhat successful, have not been scientific, and the idea has been discredited, partly because numerous spurious commercial forms have been on the market and their preparations, not containing a genuine culture or containing too small a dose, have not been effective. Massive doses are necessary and the cases must be selected. Obviously serious disease, such as gall-bladder involvement, etc., will not yield to oral administration of any kind. Cases of simple constipation seem the best field for this treatment.

The present investigation is concerned with patients who lead normal lives during treatment. The only change in diet or routine was the addition of one quart of acidophilus milk each day. Cathartics were discontinued. A warm saline enema was allowed if the bowels became constipated during the early days of

the experiment. Examinations of the faeces were made at the beginning of treatment and at weekly intervals. The milk was continued for 8 to 10 weeks; then an interval of 2 to 3 weeks was followed by a second course. The length of time that the effect lasted after stopping the milk increased with each interval, until the patient was judged cured; with occasional "check-ups." The objective sought was a permanent implantation of the acidophilus bacillus in the intestine.

A series of 36 cases was studied. Twenty-seven responded positively. Some distension and discomfort were experienced in the early weeks, but this was only temporary, and gradual relief and improvement followed, with softer and more frequent stools, and a marked rise in the *B. acidophilus* count. This count decreased during the milk-free intervals, along with a gradual return of the initial constipation. Permanently relieved cases showed consistently high *B. acidophilus* counts and were called "implanters". Of the 36 cases 27 gave positive results, clinically and bacteriologically. The reasons for failure in the other cases was not always clear, but they all failed to show an ability to "implant" the organism.

P. M. MACDONNELL

Some New Observations on the Diagnosis and Treatment of Syphilis. Davies, T. A., *Brit. M. J.*, 1933, 2: 487.

The author points out that anæmia, pains in the joints, persistent headache, nausea and pyrexia occur in about 50 per cent of cases of syphilis in the primary stage; in women these symptoms justify the insertion of a vaginal speculum, to inspect the cervix for chancre. The absence of inguinal lymphadenitis definitely does not exclude syphilis. When lymphadenitis does occur, the glands tend to be large and elastic, rather than small and shotty. In women the primary sore occurs on the cervix in 44 per cent of cases and on the labia majora in a further 31. A cervical chancre may present many appearances, but its edge is usually well-defined and regular. The common erosive type (71 per cent) is bluish red in colour and is covered with small hæmorrhagic spots. A syphilitic chancre is only indurated when more than ten days old, when it has begun to heal. An infrequent, but diagnostic, occurrence is œdematous induration, the neighbouring tissues being enlarged, painless, "indiarubbery" and brawny, but do not pit.

The author has some suggestions to offer concerning treatment, based on personal observations. He has watched the *Treponema pallidum* in salvarsanized serum under the dark-field, and noted that in about five days' time they lost their normal appearance, became ghost-like, fragmented and paralyzed and apparently dead; but in a few hours revived

again and became as active as their control fellows. This suggested that treatment should be administered at 5-day or shorter intervals, instead of waiting the usual week. Consequently, the following course was instituted at the Whitechapel Clinic some three years ago: 1st to 5th week—intravenous neoarsphenamine, 0.45 gram weekly; bismuth, 0.2 gram; deep subcutaneous sulpharsphenamine, 0.3 gram weekly. 6th to 8th week—Mist. Pot. Iodidi, grs. V-XV, t.d.s. p.c. 9th to 13th week—Repeat as during first 5 weeks; the total arsphenamine being 7.5 grams; total bismuth, 4.0 grams in 13 weeks.

The patients have a blood test 1 week after the end of the course; they report back in another 4 weeks and are given potassium iodide till the next course. The patient's weight, albuminuria test, and urobilinogen test are taken at each injection and a prophylactic draught of concentrated liver-extract and glucose given.

The results have been most gratifying. The author feels that the subcutaneous route is more efficient, safer, and causes fewer toxic complications than the intravenous. In this course the two methods alternate, so that the tissues are subjected to continuous regular absorption of the drug over a long period. It is important that the weekly dosage be not raised but always kept the same, just beneath the threshold of intoxication. Complications have been comparatively few, and none of them have proved serious.

Some interesting figures are given in conclusion. Before treatment, some 300 mothers had had 739 pregnancies of which over 50 per cent were unhealthy. After treatment, the number of pregnancies was 305, of which just over 9 per cent were unhealthy. Mothers receiving under one course of treatment—less than 5 grams of arsphenamine—had 30 per cent unhealthy pregnancies; those receiving more than one course had only 3.75 per cent unhealthy pregnancies. The tremendous difference a few extra grams of organic arsenic made to these mothers and their babies is obvious.

W. FORD CONNELL

Hygiene and Public Health

Health Aspects of Radium Dial Painting.

I. Scope and Findings. Schwartz, L., Knowles, F. L., Britton, R. H. and Thompson, L. R., *J. Indust. Hygiene*, 1933, 15: 362.

This is the first of a series of articles reporting the work of a special commission appointed by the Surgeon-General of the United States Public Health Survey to investigate the health hazards of the radium watch-dial industry. A summary of the findings is given with a list of recommendations as to the proper precautions

to be taken to safeguard the health of the workers.

Dust in the air of the work room was found to be radio-active. In the vicinity of the dial painters the concentration of the radio-active dust in the air was found to be two to three times that of the general air of the work room.

The workers were divided into two groups: (a) those employed since January 1, 1927, (on which date pointing of the brush in the mouth was generally prohibited); and (b) those whose exposure in part at least was before January 1, 1927. In both groups evidence of the accumulation of radio-active material in the body was found. The greatest amount of radium found in a worker in Group A was 3.5 micrograms and in a Group B worker 11.3 micrograms. No definite evidence of bone changes were found in Group A workers. Evidence was found, however, in some Group B workers, particularly focal atrophy (osteoporosis).

FRANK G. PEDLEY

Pathology and Experimental Medicine

A Virus Obtained from Influenza Patients.

Smith, W., Andrewes, C. H. and Laidlaw, P. P., *The Lancet*, 1933, 2: 66.

Throat washings were obtained from patients as early as possible in the onset of disease during an influenza epidemic early in 1933. The washings were filtered through membranes impermeable to bacteria (0.6 to 0.25 μ) and filtrates were found to be bacteriologically sterile under aerobic and anaerobic conditions. Many animal species were tried and finally the ferret was found to be susceptible to infection by the filtrate. Intranasal inoculation was followed by a two-day incubation period and then an acute illness with a primary and secondary rise of temperature, nasal catarrh, sneezing and lethargy. After ten days the animals appeared well. There were no fatalities in 64 cases. Histological study of turbinate bones showed acute inflammation of mucosa and all soft parts with no specific features. The disease was readily transmissible from ferret to ferret by cage contact or transfer of nasal washings. Nasal washings from healthy human beings and from a patient with a common cold caused no infection in ferrets. No micro-organism was found which would mimic this disease syndrome and the combination of various bacteria with filtrates modified the course but little. Animals recovering from the illness produced by inoculation were found to be immune to the virus at later periods; no immunity was developed in any way except by giving the disease itself. Blood serum from convalescent ferrets mixed with the filtrate before intranasal inoculation neutralized strong virus emulsions. Normal ferret serum had no such power.

Normal and influenza-convalescent human sera showed neutralizing properties, but of very variable degree. Swine influenza virus caused the same disease picture as the human virus in inoculated ferrets and these ferrets developed immunity to human virus filtrates. The authors conclude that these results are consistent with the view that human influenza is primarily a virus infection which may facilitate and be complicated by the invasion of visible bacteria.

JAMES B. ROSS

Certain Functions of the Adrenal Cortex.

Hartman, F. A., *New Eng. J. of Med.*, 1933, 209: 481.

In cortical insufficiency asthenia stands out. Changes in the nervous system are manifested early. Animal experiments have demonstrated that the reflexes and the myoneural junction, as well as the muscle itself, are much more easily fatigued after removal of both adrenals. Injection of cortin increases the resistance to fatigue. In normal human beings, sometimes the injection of cortin produces effects, not when they are in excellent condition but when they are tired from overwork or recovering from an infection. In cortical insufficiency the ability of the muscle tissue to undergo normal metabolism seems to be impaired. The resistance of intact muscle to fatigue after cortin injections was increased.

Cortin is necessary for normal kidney function, because if the subject goes long enough this organ begins to fail. Started in time, cortin corrects this condition. In chronic adrenal insufficiency of cats there is an accumulation of large quantities of lipoid substances in the *tubuli contorti*. Cortin stops nausea and vomiting; appetite reappears and weight is regained.

Cortin is essential for growth in adrenal insufficiency. This is also true of the healing of tissues. Cortin increases the resistance of adrenalectomized animals to bacterial toxins. Infections increase the demand for cortin. The adrenal glands hypertrophy in vitamin B and C deficiencies. A substance is produced in the cortex, which, if injected, delays the onset of B and C deficiency symptoms. This substance is most effective when some vitamin is present in the organism. It offers no protection in vitamin A deficiency.

It has been shown that the interval between menstrual periods can be shortened 3 to 5 days in normal women by the injection of cortical extract. Whether cortin alone is responsible for these influences on the sex organs, or whether cortin is merely necessary for the well-being of the rest of the organism remains to be settled. Pigmentation is not always present in Addison's disease. In four cases definite decrease in pigmentation was shown after the use of cortin. After recovery from a relapse in a severe case of

Addison's disease desquamation over the body may become very marked.

A hormone was sought when it was found that adrenalectomized rats could not nurse their young when injected with cortin alone. This substance has been obtained from the adrenal cortex, and has been called "cortilactin."

LILLIAN A. CHASE

Transplantation of the Intact Mammalian Heart. Mann, F. C. *et al.*, *Arch Surg.*, 1933, 26: 219.

Mann and his associates describe a technique for homo-transplantation of the intact mammalian heart. Auto-transplantation or reimplantation of tissue or of an organ in the same subject is often successful, while homo-transplantation or implantation into another subject of the same species is rarely successful. Obviously the experimental work which these authors carried out was with homo-transplantation of the heart. The essential procedure was to establish coronary circulation of the transplanted heart by anastomosing its aorta to a suitable vessel of the recipient. Two technical methods were developed which gave about equally successful results. With the first method, the tonus of the heart had to be maintained as long as possible throughout the procedure, and an endeavour was made to establish the coronary circulation by anastomosing the central end of the carotid artery to the aorta, which was accomplished by first preparing the necessary vessels of the recipient, and then obtaining the heart from the donor, by the judicious ligation of the larger arteries in relation to the ligation of the larger veins, so that effective coronary circulation was maintained as long as possible. To maintain the cardiac tonus and to obviate the possibility of intravascular clotting, speed was necessary in operating. Transplantation of a heart was found possible when the time between the cessation of the contraction of the heart and the establishment of the coronary circulation with the blood of the donor was less than five minutes. With the second method it was essential to ligate the large veins before the large arteries, and thus prevent the possible dilatation of the heart and at the same time stop its contraction. To prevent intravascular clotting, the donor was heparinized just before operation, and the coronary circulation was established by an anastomosis of the aorta to the peripheral end of the carotid artery. Such transplanted hearts may beat vigorously for as long as from one to eight days.

G. E. LEARMONTH

Aplasia axialis extracorticalis congenita.

Perkins, O. C., *Am. J. Dis. Child.*, 1933, 46: 1347.

Nearly fifty years ago Pelizaeus described a group of cases in one family, who were affected

with a degenerative disease of the nervous system which began in early life, and progressed to a point, after which it remained stationary, the patients dying of some intercurrent infection. In 1908 Merzbacher followed up this family, and found 14 cases in all, through 4 generations. In this family the transmission resembled that of colour-blindness, the disease being transmitted by healthy females to a portion of their sons. Since that time a number of cases have been reported in which the symptoms were identical with those of the family just described, but the transmission did not always agree with the sex-linked recessive type found in that family.

Perkins describes a family, in which 4 girls were affected, and in which there had been no history of the affection in any of the family or its collaterals, so far as known for three generations. The father and mother were Italians; there had been 12 pregnancies. Three girls and three boys were normal; two pregnancies had resulted in miscarriages; four had resulted in the patients of the report. One of these had died, aged 7. The living children affected were aged 9, 5 and 4. They were the outcome of the 6th, 7th, 11th and 12 pregnancies. The history was identical in all the cases. The child learned to walk and talk at about one year of age, and seemed normally intelligent. At about 3 or 4 years, stumbling, inability to keep their feet and manage their legs were noted. The signs and symptoms present in all were: (1) spastic paralysis of the lower extremities; (2) ataxia; (3) intention tremor; (4) scanning speech; (5) increase in the deep reflex; (6) positive Babinski; (7) loss of abdominal reflexes; (8) mental impairment; (9) weakness of the trunk and neck muscles; (10) increase in the size of the head over normal; (11) normal sensation; (12) normal cranial nerves; (13) normal fundi; and (14) loss of sphincter control.

The father had a four-plus Wassermann reaction; the Wassermann of one of the patients was one plus. The author considers that this disease was not congenital syphilis in the ordinary sense of that term, but that the toxin of the disease actually altered the chromosomal pattern of the germ-cells in the parents, with the result that a degenerative process now transmissible by germ plasma from parent to offspring was instituted. The objection to this is that such a disease is rare, and many parents have syphilis; therefore one would expect to find this disease more frequently. The probabilities are that this disease is due to a pair of recessive factors in this family, and that when the two parents mated, the factors which each carried latent were capable of uniting in their offspring, and of producing the evident disease.

M. THURLOW MACKLIN

Obituaries

The Late Professor Swale Vincent

Thomas Swale Vincent was born in Staffordshire, England, on May 24, 1868, and died of cancer at St. Albans, near London, on January 1, 1934. He was educated at the King Edward Grammar School, Birmingham, and studied medicine first at the old Mason College (now the University of Birmingham), taking his M.R.C.S., L.R.C.P., and later, his M.B. (Lond.). His whole subsequent career was devoted to the study of physiology and related sciences. He commenced research work under Schafer (now Sir Edward Sharpey-Schafer) in University College, London, as holder of the Sharpey Scholarship, in 1890. Between 1890 and 1902 he acted at various times as Senior Demonstrator and Assistant Professor of Physiology at University College, London, and Lecturer in Physiology in University College, Cardiff, also spending a short time at Heidelberg, doing research under Kossel. During 1902-4 he held a Research Fellowship in the University of Edinburgh, again under Schafer, obtaining his D.Sc. from that University in 1904, and his M.D. (Lond.) in 1907.

In 1904 he was appointed Professor of Physiology in the University of Manitoba (also teaching Zoology until 1910), and held that appointment until 1920, when he accepted the Chair of Physiology in the Middlesex Hospital Medical School, a post carrying with it a Professorship in the University of London. From this Chair he retired in 1930.

As a student of Schafer he naturally became interested in the study of endocrinology, and for well over thirty years published a constant succession of papers dealing especially with the adrenals, pituitary, thyroid, islets of Langerhans, and ovaries. Perhaps his most successful work consisted of his studies in the comparative anatomy, histology, and physiology of certain of these glands, while his abiding claim to remembrance as an endocrinologist lies in his sound critical outlook on the whole subject during a period when endocrinology, especially in its clinical aspects, tended to run extremely wild. His sound judgment is mirrored in his "Internal Secretion and the Ductless Glands," first published by Arnold in 1912, later editions appearing in 1922 and 1924. He also published an interesting monograph on "Secretion" in 1924.

He was elected a Fellow of the Royal Societies of Edinburgh and Canada, received the LL.D. degree from the University of Manitoba in 1920, was Ingleby Lecturer of the University of Birmingham in 1921, and Arris and Gale Lecturer of the Royal College of Surgeons in 1922.

His personality was vivid and not infrequently aggressive. He made fast friends and some life-long enemies. His teaching was dominated by his passion for research; as a result many of his students received inspiration to become research-workers also.

The University of Manitoba owes him a perpetual debt. A small band of five scientists was appointed in 1904 to teach subjects for which the affiliated denominational colleges could not afford the funds. Prior to this time the University itself had been merely an examining body. This select scientific nucleus of the University could probably have benefited their departments and themselves more, financially, had they been content to have remained a little science coterie, but they pressed steadily and successfully against marked opposition for the establishment of a true University, teaching all subjects independently of the denominational colleges. In this movement Vincent took a large share.

He was passionately fond of music, and a brilliant amateur pianist. In this, as in most of his interests, the research aspect was never forgotten, and he published some papers on the physiological effects of music.

He is survived by his widow (née Beatrice Overton) and two daughters.
A. T. CAMERON

Dr. Arthur Rousseau, dean of the faculty of medicine at Laval University and one of the most prominent medical men in Quebec, died at his home on January 13, 1934, after an illness of five days. He was 61 years of age.

Dr. Rousseau, regarded as in the leading ranks of French-speaking physicians of Canada, was to have presided at a meeting of l'Association des Médecins de Langue Française d'Europe to be held here next August at the same time as the Jacques Cartier celebrations. He was widely known in France, being the first Canadian to be elected a member of the Pasteur Institute. The French Government honoured him some years ago, creating him a Chevalier, and later, Officer, of the Legion of Honor.

Dr. Rousseau was born in 1871 at St. Casimir, Portneuf County, son of the late Dr. L. T. E. Rousseau and Malvina Alain Rousseau. He studied at the Quebec Seminary and Laval University, from which he graduated in 1895. He then spent two years in Paris.

In 1897 upon his return to Quebec he was appointed professor of the faculty of medicine at Laval, and professor at Hôtel-Dieu Hospital. Later he became chief of the clinic at the Hôtel-Dieu and filled the position of superintendent until the foundation, in 1917, of St. Sacrament Hospital.

Dr. Rousseau helped to found three large hospitals—Laval Hospital, St. Sacrament Hospital, and the Roy Rousseau Clinic. He was a member of the Royal Commission that investigated tuberculosis in the Province of Quebec and was president of the Canadian Tuberculosis Association. He was a corresponding member of the Paris Academy of Medicine. In 1902 he was one of the principal movers in the foundation of l'Association des Médecins de Langue Française de l'Amérique du Nord.

In January, 1898, Dr. Rousseau married Miss Bernadette Landry, daughter of the late Senator P. Landry. Mrs. Rousseau survives, with two daughters, Mrs. Bernard Devlin and Mrs. E. D'Auteuil, and four sons, Dr. Louis Rousseau, Paul Rousseau, architect, Jean Rousseau, student, all of Quebec, and Philippe Rousseau, advocate, Montmagny.

Dr. Albert LeSage, Editor-in-Chief of *L'Union Médicale du Canada*, pays him this tribute.

"Rousseau was not only a great physician and a great collegian; he was a great citizen. His personality rested on solid foundations. The testimony of the whole population of the Province of Quebec, and particularly of the city and district of Quebec, proclaims his moral worth. We have the proof of this in his life and in his death. . . . He died as he had lived, with courage, simply, and with a smile, like a just man who has finished his work."

Dr. Henry E. Armstrong, Billings, Montana, died on January 10, 1934. He was sixty-six years old. Dr. Armstrong was born in Orono, Ont., on October 19, 1867. He studied medicine in Toronto and graduated in 1894. He practised for some time in Brainerd, Minn., and was later at Jamestown, N.D., until 1898 when he went to Billings, Mont. He was one of the first surgeons in old St. Vincent's Hospital, now the Orthopaedic Hospital School. When that Hospital was

built, Dr. Armstrong was instrumental both in its establishment and organization. He likewise played a prominent rôle in the organization of the new St. Vincent's Hospital. He was a Fellow of the American College of Surgeons and Past-president of Yellowstone Medical Association.

Dr. Uriah Edward Bateson, of London, Ont., aged 69, died suddenly at his home on January 30, 1934, after a heart attack. He graduated in medicine at the University of Toronto in 1889 and had practised in London for many years. One son, Dr. Varcoe Bateson, of Parkhill, survives.

Dr. Frederick Graham Brien, of Elphinstone, Man., died on December 30, 1933, in the Winnipeg General Hospital, after a brief illness, at the age of 71 years. He was born in Lindsay, Ont., and attended school there and later the Normal School at Ottawa. He came west as a young man and was principal of schools at Birtle and Selkirk. He then took up the study of medicine and graduated in 1894 from the Manitoba Medical College. He practised at Dugald, Douglas, and Winnipeg, Kerrobert, Sask., and Peachland, B.C., and lastly at Elphinstone.

Studious by nature and a sound classical student, Dr. Brien bore the reputation among his friends of being one of the best-read men in the province, though his modesty and unassuming nature prevented a wider recognition of his gifts. He was a sound practitioner and a delightful companion. ROSS MITCHELL

Dr. George Henry Carveth, of Toronto, died suddenly at Newcastle, on January 26, 1934, in his 76th year. He was born in Port Hope, educated at Bowmanville High School and at Victoria University, graduating in arts and medicine (1884) and was gold medalist of his year. Before taking up medicine, he taught school at Port Hope for a short period. He had practised in Toronto for more than 50 years, and was former head of the out-patients' department of the Western Hospital.

He is survived by his widow, Frances Crozier Carveth; one son, Dr. W. Herbert Carveth; three daughters, Mrs. Austin Campbell, Orono; Mrs. Walter Lenk and Mrs. Hudson Stowe, both of Toronto; 12 grandchildren, a sister, Mrs. Dr. Annie Higbee, Newcastle, and a brother, Arthur Carveth, Victoria, B.C.

Dr. J. A. Christilaw died at his home in Winnipeg on January 23, 1934. Graduating in 1915 from the Faculty of Medicine, University of Manitoba, he practised at Treherne, and later at Winnipeg, up to the time of his death. He is survived by his widow and family.

Dr. Samuel Cummings, of Toronto, died at the Havana Country Club (Cuba) on December 18, 1933.

Dr. Cummings was a pioneer in x-ray work in this country, and had a wide reputation as a surgeon.

Born near Hamilton about 67 years ago, Dr. Cummings received his preliminary training at the University of Toronto Medical School. After graduating, (M.B., 1888, and M.D., University of N.Y., 1888), he took post-graduate work in surgery in New York and later in Germany. He became a regular attendant at most of the important clinics in this country, the United States and Europe, making almost yearly visits to Germany up until the time of the war. He commenced practice in Hamilton, where he was among the first to envision and take advantage of the possibilities of x-rays in diagnosing and treating human ills.

In addition to his distinction in the medical world, Dr. Cummings acquired a reputation as a connoisseur and collector of Persian and other Oriental rugs, as a patron of art generally, and as a lover of music.

Dr. Perry Ernest Doolittle, of Toronto, known as "the Father of the Trans-Canada Highway" and a pioneer motorist, died after a lengthy illness on December 3, 1933, in his seventy-third year.

Dr. Doolittle was born in Aylmer and graduated from the Medical School of Trinity University, Toronto, in 1885. He settled in Toronto, where he began practice, subsequently specializing in electrotherapeutics.

Included in the public services rendered Canada by Dr. Doolittle, in addition to the promotion of good roads and the trans-Canada highway, was the furtherance of the unification of traffic laws and the sane and safe use of the highways. He was a pioneer in foreseeing and developing the revenue possibilities of United States motor tourist traffic, and he had the satisfaction of seeing the revenue which Canada derives from this traffic swell from a small amount to a quarter of a billion dollars per annum.

At the age of seven years Dr. Doolittle became the proud possessor of a homemade bicycle. He constructed a wooden bicycle with an 18-inch rear wheel and 48-inch front one. The backbone of this machine was a piece of gaspipe, and it had steel tires. The following year he built another, for which he imported rubber wheels from England. The backbone of this machine was a musket barrel, and wire wheels were constructed with the aid of a blacksmith. It was with this vehicle that Dr. Doolittle made his successful debut in bicycle-racing. A few years later he became one of Toronto's pioneer riders of the high wooden bicycle, dubbed "boneshaker." Between 1881 and 1890 he won more than fifty trophies, including the championship of Canada in 1883.

One of the charter members of the Canadian Wheelmen's Association, he was the first Vice-President, and subsequently President. Dr. Doolittle was said to have made Canada's first motorecycle. His inventions, which included the coaster brake, the demountable rim, and the Doolittle by-pass valve, took him to many parts of the United States, Great Britain, and Europe. On April 1, 1898, John Moodie, of Hamilton, imported the first motor car in Canada, and shortly afterward this car was purchased by Dr. Doolittle.

He, with the small group of Toronto motorists, organized the first automobile club in the Dominion—Toronto Automobile Club—in 1900, which remained in a state of suspended animation until 1903, when, at a re-organization meeting, Dr. P. E. Doolittle was elected its first President and T. A. Russell its first Secretary. That year Ontario for the first time required the licensing of motor vehicles, and in this initiated a procedure in Canada that in a few years was reflected by similar action by all the other provinces.

Dr. Doolittle is survived by his widow, formerly Miss Emily C. Pearson, and one son, G. W. Doolittle, of *The Globe* Advertising Department, Toronto.

Dr. William Delaney, assistant superintendent in the Department of Lands and Forests, died on January 2nd in Quebec at the age of 75. He was born at Hâvre des Maisons, Isles de la Madeleine, and studied medicine at the University of Laval, Quebec, where he graduated in 1886. One of the oldest doctors of the ancient city he loved to say that he only practised his art in case of accident. He was very affable and a great lover of sport. His widow, née Clare Hearn, survives him, and one son, Dr. E. Delaney, dentist.

Dr. Walter Seymour Downham, of London, Ont., died suddenly on December 29, 1933, in his 54th year.

Dr. Downham was a graduate of the University of Western Ontario (1912). He is survived by his widow, Effie Downham.

Dr. Harry Lloyd Emmett, of Fonthill, Ont., died on December 16, 1933, following an illness of three days. He was a graduate of Toronto University (M.B., 1908).

Dr. Louis de Grandpré died suddenly on December 20, 1933, at Berthierville, where he had practised medicine for the last 55 years. He studied at the College of Joliette and Victoria College, where he graduated in medicine in 1879.

Dr. Frederick Howard Heming, Medical Officer of Health for Meaford, Ont., and well-known Grey County physician, died on January 3, 1934, from a heart attack. He was ill but a few minutes. Dr. Heming was a graduate of the University of Toronto (1892) and first practised at Norval, Muskoka, coming to Meaford about thirty-five years ago. He is survived by his widow, formerly Miss Plunkett, of Meaford. Dr. Heming was 64 years of age.

Dr. Archibald Crosse Hunter, medical officer of health and a widely known family physician of Goderich, Ont., died suddenly on December 23, 1933, following a heart seizure. Earlier in the evening he had walked about town distributing his Christmas gifts but after returning home complained of a slight indisposition. As his condition became aggravated, Drs. A. H. Macklin and Harold Taylor were called but they were unable to revive their esteemed colleague. Death occurred shortly past midnight.

Doctor Hunter was born in 1869 and graduated at Trinity Medical College in 1891.

Of the immediate family, two sons, Kenneth and Colin, and one daughter, Beatrice, had gathered at the home of their parents in anticipation of the customary Christmas reunion. Another daughter, Mrs. George Copeland, of New York City, was also coming. The tragic suddenness of the doctor's passing came as an unwelcome realization to a host of friends with whom he was very popular. A sister, Mrs. Alex Leslie, of Chesley, Ont., joins the family in mourning their loss.

Dr. Henry Seaton Hutchison died suddenly from coronary thrombosis on January 6, 1934, in his fifty-fifth year. Doctor Hutchison was the son of Henry Hutchison, of the old Toronto firm of publishers, Rowsell and Hutchison, and was educated at the Model School, Toronto, and Upper Canada College. He graduated in medicine at the University of Toronto in 1900. He was a Foundation Fellow of the Royal College of Physicians of Canada. In the University of Toronto he was Assistant Professor of Medicine, and special Lecturer in Life-Insurance; in the Toronto General Hospital, physician in charge of the Out-Patient Department. He was, also, for many years a medical examiner of the Canada Life Insurance Co., and in recent years Chief Medical Officer, Crown Life.

Dr. Hutchison is survived by his widow, daughter of the late T. D. Delamere; three sons, Henry Seaton, Ralph Delamere, Alan Delamere; and one daughter, Grace Bickford.

AN APPRECIATION

An intimate friendship with Dr. Hutchison for more than thirty years does not make it easy to do adequate justice to his memory, now that he is gone. Many of us were fascinated by the charm of his personality in those far-off days. But, as the years produced their burdens and responsibilities, his quiet, cheerful and unostentatious assumption of a very heavy share added to this an admiration grounded on his genuine merit.

His professional attainments in many directions were outstanding, and yet he did not hesitate to efface himself at such times as he thought his patients'

interests could be advanced by opinions gathered elsewhere. His concern was always first for others, whether they were his patients, his family, or his friends, and no consideration for himself was ever heeded before he had done all in his power to help those who came within his sphere. Concurrently with his medical work he read and conversed on widely different subjects, and so it was that on his death scores of his patients mourned the loss, not only of a painstaking and skilful physician, but also of a beloved friend. His habit of self-sacrifice was best appreciated in his administration of the huge Out-door Medical Clinic at the Toronto General Hospital, which has developed so greatly in recent years. Here his patients received the same meticulous care as those who were placed much more fortunately, and throughout the country are many practising physicians who will remember the training they received from him in this very practical form of work. It may not be known to many of the younger members of the profession that Dr. Hutchison was mainly responsible for the origin of that historic institution, Daffydil Night, but to him it was one of his fondest memories. In all respects it can be said of him that "he was a very perfect gentleman."

ROBERT G. ARMOUR

Dr. John Bowring Lawford, a famous oculist, died in London, England, early in January.

Dr. Lawford was born in Montreal in 1858, the eldest son of the late Frederick Lawford, and was unmarried. After taking his course at McGill he went to London and continued at St. Thomas's Hospital to which he later became ophthalmic surgeon. He received the honorary degree of LL.D., from McGill. He was a member of the medical appeal board of the Royal Navy, Fellow of the Royal Society of Medicine and an ex-vice-president of the Section of Ophthalmology, London; ex-president Ophthalmological Society of the United Kingdom; ex-president of the Council of British Ophthalmologists; honorary member, Soc. Française d'Ophthalmologie; hon. Fellow of American Laryngo-Rhino-Otological Society. He contributed many papers in medical periodicals devoted to ophthalmology and in the *Encyclopædia Medica*. His home was at Sagamore, Ashstead, Surrey.

Dr. James E. Mason, a graduate of Western University (1916), who formerly practised at Hanna and later at Stettler, Alberta, died in January, 1934, on board ship in the Pacific Ocean. He had been ailing for some time and had taken a position as ship's surgeon on the *S.S. Niagara* to regain his health. Death came during sleep. The body was buried at sea.

Dr. Joseph Elzear Masson, of Montreal, died on January 5, 1934, at his home, Outremont, after a month's illness, aged 61. Inspector of the Provincial Bureau of Health for the district of Joliette and former M.L.A. for Montmagny.

Born at Grosse Ile, Que., son of Joseph Edouard Masson, Dr. Masson received his education at Quebec Seminary and Laval University, Quebec (1899), and, on receiving his degree opened a practice in Montmagny, where he soon became a widely known and popular figure, and for which he sat for some years as member of the Quebec Legislature.

Twelve years ago he entered the service of the Provincial Bureau of Health, sold his practice, and moved to Joliette. Two years later, he moved into Outremont, where his wife, formerly Mary Convery, of Quebec, predeceased him on October 1, 1933.

Surviving are three sons, Wilson, Harold and Malcolm, all of Montreal.

Dr. Neil Charles McKinnon, of Brougham, Ont., died on January 16, 1934, in his 77th year. He was a graduate of Victoria Medical College (1885).

Hon. Dr. Joseph Dunsmore Monteith, of Stratford, Ont., died on January 8, 1934, aged 68 years.

He was born on June 2, 1865, on the farm, the son of Andrew and Mary Jane Dunsmore Monteith, of Downie Township, Perth County, both of Irish stock, and was educated in the rural schools and Stratford Collegiate Institute. He graduated in medicine from Trinity University, Toronto, and practised as a physician in Stratford from 1895 to 1925. During his early years he found time to work on the farm and teach school for various terms.

Dr. Monteith was a member of the Board of Education of Stratford for eight years and became mayor of the city in 1917 after two years' service on the city council. Entering provincial politics, he was elected in 1923 to the Ontario Legislature for North Perth, as a supporter of the Conservative Government of Hon. G. Howard Ferguson. He was re-elected in the general elections of 1923 and 1929.

Dr. Monteith was called to the Ferguson cabinet as Provincial Treasurer in 1926, and after four years at the head of the Provincial Exchequer, he was transferred to the Department of Public Works and Labour. The doctor's energy, ability and outstanding tact were reflected in his guidance of these departments through some of the most important years in the history of the province.

Dr. Monteith's political activities carried on a tradition of his family. His father, Andrew Monteith, was a member of the first provincial legislature after Confederation, and later represented North Perth in the Dominion House. J. C. Monteith, a brother, was at one time mayor of Stratford, while he was also related to the Hon. Nelson Monteith, former Minister of Agriculture under the late Sir James Whitney. Hon. Dr. J. M. Robb is a cousin.

Dr. Monteith is survived by his widow, Alice Mary Chowen, one son, Waldo, and one daughter, Mrs. Gordon Forbes, both of Toronto; also by three brothers, J. G. Monteith, of Stratford, H. J. Monteith and W. A. Monteith, both of Downie, and by one sister, Miss Christine Monteith, of Stratford.

Dr. Daniel Webster Shier, of Toronto, died on January 6, 1934, in his sixty-sixth year. He was born near Lindsay and was a graduate of Trinity University, Toronto (1895). He is survived by his widow, née Bessie Isabella MacIntosh; two sons, Dr. Leonard V., of Lindsay, Ont., Donald, of Weston, and one daughter, Marion, of Weston.

Dr. Benjamin Edward Thompson, of Stoney Creek, Ont., died at his home on January 8, 1934. He was a graduate of Toronto University (M.B., 1891).

Dr. Thompson had had a long career in the medical profession and for several years served as chairman of the Wentworth County Medical Committee. He also occupied the post of coroner. During his 40 years in Stoney Creek, Dr. Thompson gave his services generously to the community. For 38 years he was secretary-treasurer of the public school board, later becoming vice-chairman. He held high office in the Masonic order, being at one time D.D.G.M. of the Grand Lodge. For several years he was treasurer of Wentworth Lodge No. 166, A.F. and A.M.

Dr. John Urquhart, one of the Dominion's oldest doctors, died at his home at Oakville, Ont., on December 17, 1933. He was 90 years of age.

A student at the famous Rolph School of Medicine, Toronto, in 1866, a graduate of Trinity College (1883), and a successful post-graduate student at the Royal College of Physicians, Edinburgh, Dr. Urquhart gave little promise of a professional career as a youth. At the age of sixteen, he ran away from home, and made his way by boat and train to Buffalo, where he arrived penniless. There he fell in with "Cud" Wagner, also from Oakville, and together they shipped

as foremast hands aboard the schooner *Alice Grover*, plying the lower lake ports. For several years he followed the lakes, shipping under such masters as Capt. George Morden, Capt. Felan, and Capt. Sam Williams, of Oakville. Ultimately listening to his father's advice, he took up farming, but soon tired of this and settled down to a medical career.

Although a busy man during the greater part of his professional career, Dr. Urquhart was a keen student of public affairs and was twice elected mayor of Oakville. He also served a term as reeve and was for some years a magistrate of the town.

He is survived by one son, Dr. A. M. Urquhart, of Preston, Ont., and two daughters, Mrs. S. A. B. McCleary, Oakville, and Mrs. F. S. Minns, Toronto.

News Items

Great Britain

Thomas Guy's tomb.—The Chapel crypt at Guy's Hospital, which contains Thomas Guy's tomb as well as those of Sir Astley Cooper, William Hunt, and John Love, all surgeons at the Hospital, has recently been renovated. The walls and the vaulted roof have been cleaned and whitewashed, a mosaic floor laid down, and an Elizabethan table put in, to serve, when required, as an altar, it being intended to use the crypt as an additional chapel. The crypt was formally re-opened on Founder's Day, January 6, 1934.

A Prize Essay on Anaesthesia.—The editorial board of the *British Journal of Anaesthesia* are offering a prize of £15 for the best essay on any subject directly concerned with the physiology of anaesthesia or the practice of anaesthetics. The competition is open to any person holding a qualification within the British Empire. Essays must be not less than 2,000 and not more than 6,000 words in length and written or typed on one side of the paper only. They must be submitted on or before August 31, 1934, to the Editor, at 29, St. Andrew's-mansions, Dorset-street, W.1. The editorial board will be sole judges of the competition and reserve the right to publish in the Journal any or all of the essays submitted.

Alberta

At the recent elections of the College of Physicians and Surgeons of Alberta, Drs. W. G. Anderson, of Wardlaw, R. Parsons, of Red Deer, A. E. Archer, of Lamont, and W. A. Wilson, of Edmonton, were all re-elected to the Council. At a regular meeting of the Council held in Edmonton, on January 17, 1934, Dr. R. B. Francis was elected *President* and Dr. W. G. Anderson *Vice-president*. Dr. George R. Johnson was re-appointed *Registrar* and Mr. W. G. Hunt, assistant to the Registrar.

The final results of the plebiscite were presented to the Council, showing that while a great many of the profession thought that some change in the practice of medicine was necessary and advisable, it was largely on account of the present economic conditions, under which the profession was expected to do most of the work for nothing, that the dissatisfaction was caused. The members are emphatic that any system of health insurance adopted should embody the principle of competitive practice and payment for services rendered, coupled with the patient's choice of a physician, and that only in particular cases should members of the profession be on a salary basis.

The Minister of Health made a public announcement at the recent meeting of the United Farmers of Alberta that it is the intention of the Government to pass an Act this session embodying the report of the Commission, leaving it to the municipalities or units to adopt the scheme by a vote of the ratepayers. It is not considered feasible to adopt it at the present time throughout the province and make it all-inclusive and compulsory. If having been adopted by any section of the province, and found satisfactory it is thought other sections might adopt it. No attempt will be made to force the question on the people by the Government; the people will have to decide for themselves. While the report has not yet been made public, it is understood that provision is made for competitive practice and choice of physician.

The Council is taking up the question of cancelling the discount of 20 per cent off doctors' accounts over \$6.00, as was in vogue last year. There was no deficit in the Medical Aid Fund for 1933, but a surplus almost equal to 50 per cent of the accumulated deficit of previous years.

The Executive of the Alberta Medical Association, of which Dr. B. R. Mooney, of Edmonton, is President, is meeting in Calgary with a special committee in charge of arrangement of the Canadian Medical Association meeting, planning the utmost cooperation to make this meeting a success.

It is expected that the University of Alberta will put on a "Refresher Course" in May for one week, as it did in the last two years. In view of the fact that the Province of Alberta is naturally divided into north and south sections, some suggestions have been made that a Fall refresher course might with advantage be put on in Calgary.

A special Committee of the Senate of the University of Alberta is drafting new regulations under which specialist certificates may be granted. It is felt that a physician's ability, coupled with actual experience in doing the special work for which the certificate is asked, attested by his confrères, must be essential features in the question. It is felt that the Committee must have large jurisdiction and not be tied down to too definite regulations, or specifications.

The Council has gone on record as opposed to any type of third-party medical contract wherein any lay body collects a percentage of fees earned by the profession.

Physicians, especially in the cities, have collected little, if anything, for their services to indigents. They have not realized that the amendment of the Municipal District Act, which was also in the Town Act, is applicable to cities as well, even though they had special charters. It is quite clear that all emergency first calls to the indigent sick can be collected by law from cities.

G. E. LEARMONTH

British Columbia

It is announced that a survey will be made of the facilities for treating tuberculosis in British Columbia. Hon. George M. Weir, Minister of Health and Education in the Provincial Government, has announced that he is in favour of the establishment of a sanitarium in or near Vancouver, and that he hopes to secure Federal aid for the project. At present the Provincial Sanitarium at Tranquille is filled to capacity, and there has been considerable agitation for increased accommodation for institutional care nearer to the centre of population.

The Vancouver General Hospital announces a deficit of \$173,728 on its operations for 1933. The estimated expense for 1934 is \$1,057,428, and unless a material improvement in revenue occurs the deficit for 1934 will exceed that of 1933.

The Provincial Government has announced its intention of inaugurating a scheme of contributory health insurance. Nothing will be done during the session of the house in February, but immediately following that steps will be taken to work out an actuarial basis of contributions and benefits.

The Provincial Board of Health has recently published some gratifying figures on the benefits of diphtheria toxoid. During the ten year period ending June 30, 1929, there was an average of 495 cases a year, with an average of 32 deaths annually. Immediately following 1929 the use of toxoid became general, and during the year ending June 30, 1933, only 47 cases, with 3 deaths, occurred.

During a recent church service in Vancouver an elderly gentleman fainted, and was removed to the vestibule, where a physician was attending him, when a lady stepped forward, and after feeling the pulse, announced that there was no need for alarm, as his pulse was quite strong and regular. After her departure, the physician explained his continued solicitude for the patient, for the lady had felt his (the physician's) pulse!

C. H. BASTIN

Manitoba

The Jubilee of Manitoba Medical College will be observed in Winnipeg during the week of May 14th to 19th, 1934, with a clinical week. The other Canadian universities are being invited to send representatives, who will contribute to the program, and in addition a prominent clinician, probably from the United States, will be present. The aim of the committee in charge of arrangements is not only to mark fittingly the completion of fifty years of teaching in Manitoba Medical College but also to provide a clinical program which will appeal to medical men, particularly in the Western Provinces.

Arrangements have been completed whereby Dr. A. T. Cameron, Professor of Biochemistry, is prepared to carry out the Friedman modification of the Ascheim-Zondek test for pregnancy.

The committee on medical care for those on unemployment relief appointed by the Winnipeg Medical Society and the Manitoba Medical Association has succeeded in effecting an arrangement with Alderman Andrews, Chairman of the City's Relief Committee, and Alderman Simpson of the City Council of Winnipeg whereby the principles which the doctors have been contending, namely, free choice of doctor by the patient and payment for services rendered, are recognized. The schedule of fees for medical care of those on relief is approximately half that of the regular schedule. It is provided that no doctor shall receive more than \$100 in one month and that matters in dispute shall be referred to a joint committee appointed by the city and by the medical associations.

The annual meeting of the Sanatorium Board of Manitoba was held in the Central Tuberculosis Clinic, Winnipeg, on February 6th. The report of Dr. D. A. Stewart, Medical Superintendent, was most interesting. It is twenty-five years ago since the Board of that day selected Ninette as a site for the sanatorium to be built, and at that meeting Dr. D. A. Stewart was appointed to take charge of the work of organization. Two of the original members of the Board, Dr. E. W.

Montgomery and Dr. R. M. Simpson, were present. Dr. Stewart pointed out that the travelling clinics had had 4,332 films made during the year. At one clinic a few paper films were used and are likely to come into further use in the travelling clinics. The average cost of examination for the 4,682 examinations made by the travelling clinics was \$1.26.

Post-graduate work and courses were given to 7 nurses for two and a half months at Ninette and half a month at the Central Tuberculosis Clinic.

A study was made of the racial incidence of tuberculosis in Manitoba based on the records of the year 1932. The rate for treaty Indians was found to be fourteen times the gross provincial rate and twenty-four times the white-man rate.

Only by the exercise of the most rigid economy has it been possible to maintain the previous standard of work and to avoid curtailment of services. The total cost of the whole organization was reduced by 10 per cent. The report closed with these words—"The machinery under the direct supervision of the Board, *e.g.*, the Sanatorium at Ninette, the Central Tuberculosis Clinic, and the Travelling Clinics, along with the machinery in cooperation with the Board, *e.g.*, the Public Health Nursing Service, the King Edward Hospital in Winnipeg, St. Boniface Sanatorium, the St. Boniface Clinic, and the general and special hospitals with the Winnipeg Tuberculosis Nursing Service, give Manitoba a useful and adequate anti-tuberculosis equipment."

The Bulletin of the Manitoba Medical Association at the beginning of the year appeared with a new dress and a new name. *The Manitoba Medical Association Review* has been increased so that it is now the same in page size as the *Canadian Medical Association Journal*. As might be expected at this time medical economics is the subject which occupies the greatest amount of space. There is an interesting article on Cerebral Arteriosclerosis, by Dr. A. T. Mathers. The Editor states that the *Review* will carry a new series of articles dealing briefly with the diagnosis and treatment of various clinical conditions. ROSS MITCHELL

Nova Scotia

A resolution of considerable interest to the medical profession was passed by the Municipal Council of Kings County at its meeting on January 10th. The motion was to the following effect:— That the Provincial Government be requested to enact legislation which will effectively cope with and curtail feeble-mindedness in the province. This resolution was passed following the presentation of a memorial by a delegation of medical practitioners and laymen that the Council petition the Provincial Government to take steps to "Prevent the spread of mental deficiency by segregation and sterilization of the grossly unfit." On the same day a similar note was struck by Dr. T. R. Johnson, Medical Officer of Health for Colchester County. In his report he strongly advocated sterilization of the feeble-minded. He drew attention to the fact that such a procedure was in effect in another province and in several other countries.

Dr. Glen Donovan has been appointed assistant medical officer to the Workmen's Compensation Board. Dr. Donovan was previously on the staff of the Camp Hill Hospital.

Dr. Joseph Hayes, formerly a commissioner of the Nova Scotia Tuberculosis Commission has resigned from that body to resume medical practice.

Dr. H. G. Grant, Dean of the Faculty of Medicine, represented Dalhousie University at the recent special

convocation at Mount Allison University. On this occasion the formal opening of the new buildings took place. N. B. DREYER

Ontario

A new entrance and solarium for the Cornwall General Hospital was opened on February 2nd, the gift of Mr. and Mrs. J. H. Cline.

The Groves Memorial Hospital at Fergus was seriously damaged by fire on December 29th, when the thermometer registered 20° below zero. Fortunately, the damage was confined to one room.

The replacement of the central building of the Toronto Western Hospital, at an approximate cost of \$700,000, is contemplated by the Board of Governors.

The officials of Mount Sinai Hospital, Toronto, have announced their intention to construct a \$44,000 addition, to increase their accommodation from 31 to 75 beds.

The Medical Officer of Health for the City of Toronto, in his report for the year 1933, announced that the death rate was 10.5 per thousand, which is slightly lower than the 1932 rate, and almost equal to the lowest rate for the city, which was in 1924-1925. There is a further lowering of the death rate from tuberculosis beyond the record low established in 1932. The all-time low rate for infant mortality, as set up in 1932, has been maintained.

The report on conditions in Canadian penitentiaries, as presented on January 29th by the Committee on Criminology to the Social Service Council of Canada, made the following recommendations:— (1) The segregation of prisoners to prevent contamination of the better class; (2) remuneration and constructive work for prisoners; (3) better hospital accommodation; (4) the establishment of a prisoners' welfare organization, including patrol officers paid by the Government who would secure situations for inmates prior to their discharge.

The City of Hamilton reports the death rate from tuberculosis for 1933 as 28.5 per 100,000, the lowest in the city's history. The rate for 1932 was 42.3.

The Honourable Minister of Health, Dr. J. M. Robb, has undertaken an experiment in placing certain mild mental cases in private homes. It is the general opinion that this will not only lessen the crowding in mental hospitals, but that these patients will benefit from such a change of environment.

The York County officials announced that there will be a material saving in money effected by paying physicians to handle maternity cases in private homes instead of paying hospital rates for obstetrical care.

The *Owen Sound Daily Sun-Times*, on January 27th, contained a hospital supplement of twelve pages devoted to the Owen Sound General and Marine Hospital. A strong tribute is paid to the efficiency of the hospital, now in its fortieth year.

Dr. A. E. Archer, of Lamont, Alta., addressed the Academy of Medicine, Toronto, on February 8th, on the subject of "Health insurance in Alberta."

J. H. ELLIOTT

Quebec

On May 18, 1932, the City of Verdun brought action against a dairyman, because his milk contained a high percentage of bacteria and *B. coli*; analyzed many times, during a period of 4 months, it contained *B. coli* constantly in one c.c. and twice, in 1/10 c.c.

The case was heard by the Recorder's Court of the City of Verdun and dismissed.* Following this decision, the dairyman thought good to take action in the Superior Court against the City of Verdun for damages caused to his reputation and trade, and under the pretext that in bringing him into Court, the Health Department of the City of Verdun had acted maliciously. During the hearing of the said case, many experts called as witnesses expressed the opinion that the milk of the said dairyman, according to the report of the analyses, was to be considered doubtful from a sanitary point of view, and the action taken by the dairyman against the City of Verdun was dismissed with costs.

In its decision, the Court declared that the City of Verdun acted in good faith and that it could not be too severe in the application of those of its by-laws that concern Public Health; it adds: "*It is to be presumed that if the Recorder of the City of Verdun had had the advantage of having before him the elaborate proof produced in this case, he would have come to another decision than the one he rendered thereon.*"—*Bull. of Hygiene*, 1933, 19: 3.

Dr. D. Léonard, assistant in electro-radiology in the Faculty of Medicine, University of Montreal, and at Notre-Dame Hospital has been awarded the Apostoli Prize by the Academy of Medicine of Paris, for his work on "High Frequency Currents in Gynecology," which he wrote in collaboration with Prof. A. Laquerrière, the Chief of his Department.

Prof. B. G. Bourgeois, Surgeon-in-Chief of Notre-Dame Hospital, Montreal, has been elected a Corresponding Member of the National Society of Surgery of Paris.

The rate of infant mortality in Montreal has decreased from 155.6 per 1,000 births in 1921 to 95.6 in 1933.

In this time the figures have dropped as follows: 1921, 155.6; 1930, 124.8; 1931, 113.3; 1932, 98.9 and 1933, 95.6. In 1921 there were 3,289 deaths of infants from birth to one year; in 1930 the figures were 2,620; in 1931, 2,345; in 1932, 1,979, and in 1933, 1,817, despite constant increase in the population of the city.

On the other hand births in 1921 were 21,136, while in 1931 they were 20,699, in 1932, 19,997 and in 1933, 19,000.

General mortality decreased from 15.74 per 1,000 of population in 1921 to 10.60 per 1,000 in 1933. Deaths from tuberculosis in 1921 reached 920, or 148.75 per 100,000 of population; in 1933 they were 811, or 95.74 per 100,000. Figures for 1930 were 983, or 123.37 per 100,000; 1931, 887, for a rate of 108.35; and in 1932, 834, for a rate of 100.11.

Contagious diseases reported in 1933 reached a total of 12,880 as compared with 12,942 in 1932, a slight decrease. Tuberculosis cases reported in 1933 totalled 2,091 as compared with 2,142 in 1932.

Deaths from various causes showed the following comparisons with 1932: Typhoid, 1933, 4.01 per 100,000 of population; 1932, 4.45; diphtheria, 2.13 and 6.36; tuberculosis, 79.10 and 86.67; poliomyelitis, 0.71 and 1.32; cancer, 109.92 and 98.80; diabetes, 20.19 and 20.77; heart trouble, 160.92 and 159.19; suicides, 1933, 54; for 1932, 52; accidents, 1933, 333; 1932, 391.

Totals of deaths reported in the year 1933, 8,975, and for 1932, 9,728.

* In the Recorder's Court, the decision rendered is without appeal for the plaintiff.

Saskatchewan

At the clinical meeting of the Regina General Hospital staff Dr. E. B. Alport presented a case of a girl aged twenty who had menstruated. She complained of pain in the lower abdomen, where a boggy mass was palpable. The vagina was shallow, but long, and no trace of a cervix could be found. The diagnosis was enlarged uterus filled with blood. The question discussed was whether to do a hysterectomy or whether to manufacture an opening into the uterus so that the menstrual flow could come away regularly. Dr. D. C. Hart reported two such cases where a satisfactory opening had been made. Dr. J. A. Brown reported having seen one such case.

Dr. D. S. Johnstone presented five cases of cancer. The first was a woman who had had a basal cell epithelioma removed three years ago from the outer canthus of the eye. Radium had been applied; one skin graft was done and another is to be done. Case two was a man who had a basal cell epithelioma of the orbit. Radium had been given once with no effect. The growth had spread over the cheek and was removed by electric coagulation. The orbit had completely healed over and the man is now well. Case three was a man with cancer of the buccal mucous membrane, first noticed eight months ago. Four months later he mentioned it to his doctor again, and he probed it to see what there was; it looked like granulation tissue; after that it grew very fast. It was removed with a cautery. Heavy x-ray treatment was given with no effect. It was removed again and radium was used. The swelling of the neck is now gone, and it is healed except for an inch over the jaw which aches like a toothache. Case four was a man with cancer of the tongue due to bad mouth hygiene. A swelling on the outer edge of the tongue, one inch by three-quarters of an inch raised up, with two small ulcers was seen. No treatment has yet been given. Case five was a man with basal cell epithelioma of the ear, another growth on the outer canthus, and another growth under the left eye. This case has not yet been treated.

Dr. E. T. French presented a case of ruptured appendix in a man aged 69 who had had pain for two days, but had worked. There was no vomiting; the temperature was 101°; there was tenderness over the right lower quadrant. Operation showed free fluid and pus. The appendix was in pieces; the tip was removed, two drains were inserted but the patient died five days after the operation. The discussion that followed centred on the treatment of ruptured appendix, and how much drainage should be used, whether saline should be used intraperitoneally, or whether the patient should be left for a few days to see whether resistance would be established.

Dr. H. L. Sieg presented a case of a girl, aged 9, whose complaints were pain in the back and inability to walk. On examination she showed curvature of the spine. She was running a temperature between 99° and 102°. She was referred to the tuberculosis clinic, and was in the sanatorium for one month for observation, but was discharged as non-tuberculous. Within the next two months her lymphatic glands had become palpable. The cervical glands, which were the first to become enlarged, were freely movable and discrete. The other lymphatic glands were palpable. The spleen could be felt two inches below the costal margin; the liver was palpable but not tender; the child was weak and had some analgesia. On December 8 her white blood count was 4,000 (65 per cent polymorphonuclears and 35 per cent lymphocytes). On February 2, her white blood count was 2,000 with 10 per cent polymorphonuclear leucocytes and 90 per cent lymphocytes. The diagnosis was Hodgkin's disease.

At the Regina Grey Nuns' Hospital annual staff meeting the following were elected to office: *President*,

Dr. J. T. Waddell; *Vice-president*, Dr. LeBoldus; *Secretary*, Dr. J. B. Trudelle; *Executive*, Drs. Laurent Roy, E. T. French, and A. C. McMillan.

LILLIAN A. CHASE

United States

The Chicago outbreak of Amœbiasis.—A special committee assembled to study the available data with a view to determining the source of the outbreak and to drawing of recommendations for the prevention of similar catastrophies in the future has just reported.

The evidence appears to be sufficient to warrant the opinion that this outbreak of amœbiasis originated in two hotels as a result of the contamination of the water supply of the hotels with sewage. Thereafter, no doubt, widespread infection of the food handlers and the employees of the hotel in general served to aid in the spread of the infection to guests. The unusual incident recited in a paper by Bundesen, Tonney and Rawlings,¹ in which raw river water was turned by a cross-connection into the water supply of manufacturing plant, resulting in an outbreak of amœbiasis, which included also some cases of typhoid, serves as a remarkable control case, to demonstrate the possibilities.

While the report of the committee serves many useful purposes—for example, its listing of standard laboratory technique and standard methods of prophylaxis—its most vital section would appear to be the recommendations concerning sanitary engineering of large buildings and hotels. Notwithstanding the fact that the laws of practically every state and municipality forbid the existence of cross-connections in plumbing which permit sewage or contaminated water supplies to mix with supplies of water for domestic uses, it is apparent that such cross-connections actually do exist in many of these hotels and buildings and that they are a constant menace to the health of human beings.

It is obvious that there are throughout the United States numerous buildings and hosteleries with antiquated plumbing incapable of withstanding the stresses likely to be placed on it by the demands of modern congestion. Until such equipment is suitably inspected and brought down to date in accordance with the building and the number of people whom it must serve there can be no warrant that similar outbreaks will not occur in any place where similar conditions prevail.

Amœbiasis has been a rare diagnosis in most northern communities, so rare indeed that suspicion is now aroused as to the frequency with which it may have been overlooked. Now comes good evidence that from 3 to 5 per cent of the entire population is infected. This evidence justifies strong emphasis on the subject in medical schools, hospitals, medical societies and other places of medical education. At the Cleveland session of the American Medical Association, to be held next June, a general scientific meeting will be held devoted wholly to this subject.

General

The C.A.M.C. in Winnipeg.—In November and December of 1933 a C.A.M.C. school of instruction was held in Winnipeg under the enthusiastic direction of the D.M.O., Major H. M. Cameron. Seven C.A.M.C. officers wrote the department examinations for qualification from Captaincy to Majority, and twenty-two wrote for qualification from Lieutenantcy to Captaincy. Correspondence courses are going on all the time and

examinations are being written by C.A.M.C. officers in the outlying districts of Manitoba who are unable to come in to Winnipeg to attend the school.

During the last four years about seventy medical students have qualified for "A" and "B" certificates (Lieutenancy and Captaincy) C.A.M.C. in the Manitoba contingent C.A.T.C.

The D.M.O. Major, H. M. Cameron, is an enthusiast of the first order. He has at present under contemplation the formation of a C.A.M.C. association early this year for the purpose of organizing and awakening further enthusiasm especially among the younger medical practitioners of M.D. No. 10. (From Dr. C. Neilson, Winnipeg).

"Damaged Lives."—The picture, "Damaged Lives", prepared under the supervision of the Canadian Social Hygiene Council in Hollywood last Spring, has already secured a very wide distribution in Canada. It has been exhibited in theatres in every province except Quebec, and it is understood that showings will commence in Quebec shortly. It is estimated that audiences have totalled nearly 500,000 and since the end of May 85,000 pamphlets dealing with venereal diseases have been sold at showings of the picture. The picture includes a technical lecture with charts given by the General Director of the Council.

It is not without interest to note that this picture, the first Canadian picture to be made in Hollywood, will also be given a very general distribution outside of Canada. Showings have commenced in the United States, Mexico and South America, and arrangements are underway for showings of translated versions in France, Germany and other continental countries. Prints have also been sent to Australia and New Zealand.

Showings in England commenced in August and in the Coliseum Theatre in London alone 200,000 persons saw the picture in a period of eight weeks. Twenty prints are being released in London and a general distribution of the picture throughout the British Isles will ensue.

This Canadian picture constitutes perhaps the most extensive piece of health propaganda by means of the "talkie picture" undertaken to date.

The Pan-American Medical Association announces that its Fifth Scientific Congress will be held in the form of a sixteen-day cruise to Venezuela and other countries, sailing from New York on March 14, 1934. The S.S. *Pennsylvania*, a beautiful modern ocean-liner of 32,000 tons displacement, has been specially chartered for the Association.

The decision to make the Fifth Congress of the Association a "Floating Congress" is a most happy one, for it gives the members and guests an opportunity of visiting several Latin-American countries and of acquainting themselves with each other's medical problems. This trip, furthermore, will be an expression of our friendship towards our Latin-American neighbours.

At various ports of call, receptions will be arranged by the local doctors. In Venezuela the entire party will motor from Puerto Cabello to Maracay, where a luncheon reception will be given by President Gomez. At San Juan, Puerto Rico, the Association will be the guests of the Columbia University School for Tropical Medicine.

The scientific program will consist of 24 papers to be read in each medical section or six addresses daily for four days. This will be done during the voyage from Havana to Caracas. There also will be a scientific Congress of one day in Venezuela.

The Pan-American Medical Association invites members of the medical profession in good standing to join this delightful cruise with their wives and

1. BUNDESEN, TONNEY AND RAWLINGS, *J. Am. M. Ass.*, 1934, 102: 367.

families. Physicians joining the cruise may also invite a limited number of non-medical friends.

The American Express Company has been appointed the official agent for the Convention Cruise, and will handle all reservations, subject to the approval of the Association. Executive Secretary, Dr. Joseph Jordan Eller, 745 Fifth Ave., New York, N.Y.

A Centenarian.—The *doyen* of European medical men, Dr. Giovanni Gortani, died at Terzod Aquileia in Venezia on New Year's Day, aged 107. He was a specialist in malaria.

Book Reviews

The Treatment of Rheumatism in General Practice. W. S. C. Copeman, M.A., M.B., B.Ch. (Cant.), M.R.C.P. (Lond.), Assistant Physician, West London Hospital, etc. 215 pages. Price \$2.75. Ed. Arnold & Co., London; Macmillan, Toronto, 1933.

This book is written by a general physician who has endeavoured to survey the whole field impartially and to concentrate upon practical therapeutic methods which are available to the general practitioner. The term "rheumatism" is used in its broadest sense and includes acute and chronic lesions, also affections of the joints, muscles and nerves.

The book is divided into three sections. In the first, acute rheumatic fever and chorea are discussed together, with their treatment. In the next are taken up in the same manner such conditions as chronic arthritis, fibrositis, lumbago and sciatica. The third section, which comprises about two-thirds of the volume, lists the various therapeutic measures which may be used in the treatment of rheumatism. Not only are the medicinal agents discussed but physiotherapy and orthopaedic measures are taken up, as well as osteopathy and various English and Continental Spas. The author gives his experiences with a number of these agents, but the reader of necessity must pick and choose to his liking from the large number of unrecommended ones. This section contains two important chapters; one deals with the question of prognosis and the other outlines the relations of the doctor and the rheumatic patient. It is an interesting and well-written book, and if it stimulates interest in that great class of chronic patients it will have well served its purpose.

Holt's Diseases of Infancy and Childhood. By the late L. Emmett Holt, M.D., and John Howland, M.D. Tenth edition revised by L. Emmett Holt, Jr., M.D. and Rustin McIntosh, M.D. 1240 pages, illustrated. Price \$10.00. D. Appleton & Co., New York and London, 1933.

Some textbooks implant their names firmly as synonymous for authority in their subject. Thus we have come to speak of "an Osler" and also, if to a lesser degree, of "a Holt." The tenth edition of Holt's Diseases of Infancy and Childhood is a further proof of the high place attained by this textbook. It is seven years since the last edition, and that is a long time in medical matters; it is a longer time in the knowledge of diseases in children.

Apart from the changes due to altering ideas and increased knowledge on many subjects this textbook is now composed by a number of writers. While they have attempted to preserve Holt's style and manner of presenting subjects it is quite obviously not in anyone's power to do this. Most of the sections have been altered and a number of them rewritten. The addition of a bibliography is not the least of the changes and certainly increases the reference value of the book.

The section on diseases of the blood-forming mechanism, which has been rewritten, deserves attention, as it removes much of the confusion about blood dyscrasias and their classification. Many of the new sections are clearly and concisely written; that dealing with the thymus gland, its functions and its often-assumed relation to sudden death in children, particularly so. The so-called "status lymphaticus" is a term which might well be discarded. "The explanation of sudden death from apparently trivial causes is as yet completely obscure."

The article on tuberculosis presents the modern conception of this disease in children. The older ideas on susceptibility in infancy and childhood must be discarded, or at least altered considerably. The value of the tuberculin test is emphasized. In dealing with the treatment of acute poliomyelitis some critical observation should be made with regard to the use and value of convalescent serum. "Convalescent serum may be considered to have some value as a specific in poliomyelitis. . . ." "It appears to be of definite value in limiting or preventing paralysis if administered in the preparalytic stage. . . ." These statements are somewhat misleading for there is no good experimental evidence to support them, and practically all the clinical evidence is of such a nature as to make it quite impossible to draw any reasonable conclusions, either for or against the serum. In fact, what little experimental work there is, together with the best controlled clinical work, points rather to the ineffectiveness of convalescent serum.

Taken as a whole this book undoubtedly maintains its old high position in the ranks of textbooks on disease in childhood.

Surgery of the Thorax. T. Holmes Sellors, M.Ch., M.A., B.M. (Oxon.), F.R.C.S. (Eng.), Assistant Surgeon to Queen Mary's Hospital for the East End. 519 pages, illustrated. Price \$6.75. Constable & Co., London; Macmillan Co., Toronto, 1933.

The appearance of several monographs upon surgery of the chest and the surgical treatment of pulmonary tuberculosis during the past twelve months indicates the importance which is being attached to this comparatively new branch of surgery. Mr. Sellors is to be congratulated upon his success in presenting such an adequate review of the present status of surgery of the thorax in a book of about five hundred pages. In a single small volume he has condensed a consideration of anatomical and physiological principles with reference to the thoracic framework, mediastinum, pleural cavities, lungs and oesophagus. In addition, the diseases of the various component parts of the chest, not excluding the sympathetic nervous system, and including diaphragmatic hernia and diseases of the oesophagus, all receive attention. Principles of diagnosis, operative technique, and pre- and post-operative treatment, including anaesthesia, as well as the results of treatment hitherto obtained, are all outlined in an orderly fashion. The attempt to condense into one small volume such a mass of information is manifestly tremendous, and must necessarily sacrifice certain details.

The author does not aim to urge his own personal views, but rather to present a practical and critical review of the principles and practice of thoracic surgery, based upon the contributions which have been made from the European clinics, including the Scandinavian, from Britain, and from the United States and Canada. All surgeons especially interested in surgery of the thorax will want to have this book upon their shelves, and, in addition, students and practitioners may well invest in a readable precise, and, the reviewer believes, an accurate account of the present status of a fascinating and gratifying department of surgical advance.

Infections of the Hand. Allen B. Kanavel, M.D., Sc.D., Prof. of Surgery, Northwestern University Medical School, Chicago. Sixth edition, 552 pages, illustrated. Price \$6.00. Lea & Febiger, Philadelphia, 1933.

The 5th edition of Dr. Kanavel's valuable book was a distinct improvement over previous ones. The 6th edition is even better. The book has been enlarged by the addition of about 50 pages and 20 new engravings. The general style has been changed and there is a more distinct separation of experimental study and clinical application. The result is a rather more easily readable book.

Much new matter has been introduced. Almost every chapter has been improved. The chapter on "General Principles of Treatment" has been enlarged and revised, and the book should be in the hand of every practitioner if only for this one chapter. The subject of injuries (especially bites) in the region of the metacarpo-phalangeal joints is discussed for the first time.

Pelvis in Obstetrics. Julius Jarcho, M.D., F.A.C.S., Consulting Gynaecologist, Hastings Hillside Hospital. 365 pages, illustrated. Price \$6.00. Paul B. Hoeber, New York, 1933.

This monograph, in the words of the author, is "an exhaustive study of the pelvis in obstetrics, including pelvimetry and cephalometry with their clinical application." It is an excellent book of reference which will appeal mostly to the teacher and the advanced student. The historical aspects and the description of the normal pelvis are covered in a comprehensive manner.

The description of abnormalities and deformities of the pelvis is complicated by the listing of too many different systems, although the author's summing up of the clinical aspects of contracted pelvis is, on the whole, very good. The management of this type of obstetrical complication in various countries of the world is briefly but adequately described.

The various methods of attempting to measure the size of the fetal head *in utero* are described, but after all, in practice, this becomes a question of estimating the relative size of the head and pelvic inlet, and nothing preferable to the method of Munro Kerr has yet been devised.

The last 58 pages of the book are taken up with the use of the roentgen-ray for pelvimetry and cephalometry. As regards the former, Thoms' method, which is adequately described, is the most accurate to date, but it is the reviewer's opinion that even this method falls far short of any constant degree of accuracy.

The treatise is one that should be in medical libraries, but is hardly a book that will appeal to the general practitioner.

Starling's Principles of Human Physiology. Sixth edition edited and revised by C. Lovatt Evans, D.Sc., F.R.C.P., F.R.S., Jodrell Prof. of Physiology in University College, London. 1122 pages; illustrated. Price \$8.75. Lea & Febiger, Phila., 1933.

Professor Evans needs no reassurance that the latest edition of "Starling" has lost nothing under his editorship. For those not familiar with the book the general plan will be noted first. The volume is divided into five books, the first of which is entitled General Principles and includes chapters on structural, biochemical and biophysical questions; book II deals with the physiology of muscle and nerve; book III with the central nervous system and special senses; book IV with nutrition; and book V with reproduction. The order in which the various parts of the subject are treated may not be the one that all would follow, but no order is perfect and there are reasons for any one that may be chosen.

In order to keep pace with advances additions have been made to the preceding edition and extensive revision of its text carried out. The tendency is to treat matters on which there is disagreement in a dogmatic fashion. It may be that this is the only way in which they can be handled if the book is not to become too long. This shortcoming of the text is compensated by references, which, if pursued, will put the reader in a position to make his own decision. The inclusion of references is the most noteworthy feature of the new edition and adds greatly to its value. As the number that can be given is limited by the space that can be devoted to them their selection is a difficult problem. One can, of course, think of some that are absent that he would like to find, but it is apparent that a great deal of care has been exercised. The type is clear and of good size.

Bacterial Infection with Special Reference to Dental Practice. J. L. T. Appleton, Jr., B.S., D.D.S., Prof. of Microbiology and Bacteriopathology, Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania. Second ed., 654 pages, illustrated. Price \$7.00. Lea & Febiger, Phila., 1933.

This work covers a wide field. The more recent and varied concepts of many phases of immunity are briefly outlined. The bibliography is extensive. The major portion of the book deals fully with the bacterial infections with which the dental profession is particularly concerned. The author speaks with authority on this phase of the subject, and the chapters on the bacteriology of the dental pulp and on periapical infection are especially good. In this particular field this revised edition will prove a valuable reference volume in medicine and it should be a necessary acquisition to the library of every practitioner in the profession of dentistry.

It is a difficult task to discuss within the limits of a single volume the vast subject of bacterial infection, and the author obviously has realized the size of this problem.

Text-book of Neuropathology. Arthur Weil, M.D., Associate Professor of Neuropathology, Northwestern University. 335 pages, illustrated. Price \$5.00. Lea & Febiger, Phila., 1933.

The first chapter of this book is a useful reminder to the student of the difficulties and pitfalls in interpretation, which the author points out may arise as a result of autolysis and fixation in the histological study of nervous tissue. The second and third chapters, which concern ganglion cell and glial pathology, are unfortunately brief, and the microscopic descriptions somewhat inadequate. Chapter 4 deals concisely with myelin and axonal degeneration, and is preceded by some paragraphs on experimental demyelination. Anæmic and hæmorrhagic softening of the brain are considered separately in chapter 5, prefaced by some paragraphs upon cerebral oxygen-consumption, and accompanied by three general diagrams to illustrate the main vascular distribution. This is followed by an account of arteriosclerosis in chapter 6.

The chapters upon inflammation, infection and intoxication are well written and comprise one-third of the text. Subacute combined degeneration, pellagra and avitaminosis are included with the intoxications, while disseminated and diffuse sclerosis are considered with the infections. The hæmato-encephalic barrier is discussed from the experimental point of view under the short section on inflammation. Some portions are quite condensed and presuppose a certain knowledge of neuropathology on the part of the reader. For the most part the writer steers a middle course when dealing with controversial points. The section on injuries to the brain, spinal cord and peripheral nerves contains very little information; it includes

two paragraphs upon the effect of roentgen rays. The chapter on degenerative diseases includes the muscular dystrophies, the amyotrophies, the hereditary-familial ataxias, chronic progressive chorea, infectious chorea, familial amaurotic idiocy. It is briefly and clearly written. The twelfth chapter gives a fair summary of the tumours of the nervous system. The main points of difference between American and French schools of classification are mentioned in passing. The last chapter concerns congenital malformations, including hydrocephalus and tuberous sclerosis. In addition, there is a very useful appendix, with notes upon autopsy technique, fixation, and a few of the standard staining methods. Some tables of statistics concerning brain-weight and relative data are included. There is a bibliography which contains key references.

This is a welcome volume, and should serve its purpose as a general guide to the student of neuropathology and neurologist and as a stimulus toward further research. For special knowledge the reader must search the literature and use his microscope.

Histopathology of the Peripheral and Central Nervous Systems. George B. Hassin, M.D., Professor of Neurology, University of Illinois. 491 pages, illustrated. Price \$6.00. William Wood & Co., Baltimore, 1933.

The author has written this volume as a supplement to the information to be obtained from clinical neurological textbooks.

The work is divided into three main parts, dealing respectively with the diseases of the peripheral nerves, the spinal cord and the brain, and it ends with a section describing the histological technical methods in use in the author's laboratory.

In the section devoted to peripheral nerve diseases, a chapter describing the diseases of muscles is included.

Under diseases of the spinal cord the author includes his personal observations of the histological changes found in syringomyelia. He emphasizes the importance of the finding of small, scattered, focal degenerative changes in concussion of the spinal cord. In this section he also describes in full the results of his detailed investigations on the histopathology of tabes dorsalis.

Encephalitis is discussed fully at the beginning of the third part of the work. The multitudinous types of inflammatory brain disease are described, and the author groups these types into infiltrative, toxic and suppurative. This chapter is followed by those dealing with syphilis of the brain and the diseases of cerebral blood vessels. The effects of arteriosclerosis are fully discussed in a separate chapter. Chapters on traumatic lesions, involutional degenerations and extra-pyramidal diseases are followed by one dealing with diseases of the ventricles and meninges, in which the author's views as to the causation of hydrocephalus and sub-dural hæmatoma are fully considered. This section ends with chapters on tumours of the brain, brain intoxications, and a brief summary of some histological findings in epilepsy and dementia præcox.

The final section on technical methods is valuable as a guide amongst the immense numbers of histological procedures which have been evolved during the last few years.

The book as a whole deals practically entirely, as its title indicates, with the microscopical pathology of nervous diseases, and the omission of gross pathological features must detract from its value as a textbook for general use. It will, therefore, be consulted mainly by those who are interested in the finer pathology of the nervous system.

The volume is fully illustrated by good photographs.

Nutrition. Graham Lusk, Sc.D., M.D., LL.D., Late Professor of Physiology, Cornell University Medical College. *Clio Medica* No. 10. 142 pages, illustrated. Price \$1.50. Paul B. Hoeber, New York, 1933.

Much that has been written on the history of nutrition deals with the era following Lavoisier's classical experiments on respiration. Sanctorius is usually credited with being the first to study experimental nutrition. The present book takes us back a good deal further, back indeed to the days of Imhotep (B.C. 2980), the first physician mentioned in history, and traces the development of the science to the present day. The newer knowledge of nutrition, dietetics and vitamins, is considered very briefly. The material dealing with the period preceding Lavoisier is particularly interesting and novel. It includes numerous quotations from the original manuscripts. In this way the reader is able to grasp fully the nature of the arguments on which some of the mediæval theories of nutrition were based.

The era following Lavoisier is presented in more detail, and while the size of the book necessarily limits the discussion to the main purpose, the author has been able to present a limited number of original investigations. In some instances controverted views are discussed in order to give an idea of the nature of the evidence on which our present beliefs are based.

Manuel de Technique Psychometrique. Gaston Lefebvre de Bellefeuille, F.R.C.P.(C.), Professor of Clinical Psychiatry, University of Montreal. 177 pages. Price 40c. Copies obtainable from Committee for Mental Hygiene of Province of Quebec, 515 St. Gabriel St., Montreal, 1933.

The *Manuel de Technique Psychometrique*, edited by Dr. de Bellefeuille, and published by the Mental Hygiene Committee of the Province of Quebec, constitutes a valuable contribution to the medical literature in the French language of the North American Continent. Based on the mental tests of Binet and Simon, with the added revisions of Kulhman and Stanford, it is, the reviewer believes, the first time, at least in the French language, that all these tests and revisions have been gathered together in one volume, so that the intelligence of a child of three months, as well as that of a person of adult age, can be studied by following the rules laid down in this compilation.

Dr. de Bellefeuille adds an original note to these revisions by the adoption of a vocabulary of a hundred words, a graded selection which will greatly help in forming a general idea of the child's or adult's knowledge of the meaning of words. Speaking of words and the necessity of simple language in meeting the child, and quoting Drs. Binet and Simon to that effect, the author states that these authorities, writing of their method, say "our expressions are not correct, but we know they are easily understood," and again "these expressions are not faultless in style, but they have the advantage of being easily understood." To a certain extent the author of this book underwent the same difficulty in questioning the French-Canadian child as Drs. Binet and Simon experienced in dealing with their young compatriots in France. By patient observation in the examination of hundreds of French-Canadian children he has acquired their differences of expression and admirably uses their vocabulary whenever necessary, in order that they may quickly and thoroughly grasp the meaning of the questions he asks them.

This book will prove a valuable acquisition to the family practitioner, and as most of our English medical men can at least translate French, the simple and flowing style of the author will offer no obstacles. To the French members of the profession, it will prove a great boon—almost a necessity—in dealing

with the problems of modified or arrested intellectual development in the child or adult.

Needless to say, Dr. de Bellefeuille is to be highly commended for the time, patience, thought and labour given to his task. In a word, the book will be a practical addition in French to those already published in English on the subject of mental hygiene, and should have its place in the medical libraries of all those who realize the paramount importance of the mental health of the community.

Diseases of the Nervous System. W. Russell Brain, M.A., D.M., F.R.C.P., Assistant Physician to London Hospital. 899 pages, illustrated. Price \$8.50. Oxford University Press, London; Mc-Ainsh & Co., Toronto, 1933.

This text book, now issued for the first time, is an excellent work and should take its place as a standard text. The author believes that in the study of neurology one is more dependent on a knowledge of anatomy and physiology than in other branches of medicine, and so he devotes almost one-quarter of the space to such considerations. This should render the book of great value to the student body.

Recent years have seen a subdivision of interest and practice in relation to the disorders that were previously grouped under the general heading of diseases of the nervous system. Thus, there are now more or less separate departments, such as neuro-surgery, psychiatry, psycho-analysis, and so on. With such considerations in mind, it must be said that the section on neuroses in this book, covering only 27 pages, is inadequate, and it is difficult to see why the neuroses should be discussed at all and not the psychoses or mental deficiency or behaviour problems. Also, in regard to the sections on intracranial tumours and head injuries, these may be regarded as adequate introductions, but, from now onwards, such sections will be considered to merit more complete presentation by the neuro-surgeon. It is somewhat unusual to find exophthalmic goitre described in a book of this nature, and it is difficult to see why it should be included and not some other endocrine disorders.

The list of references is extensive, covering over 50 pages. The book is well produced and is a very admirable effort. It can be recommended as a sound text-book of organic neurology, valuable to the student and graduate alike, and should be in the hands of every general practitioner.

Paralysis in Children. R. G. Gordon, M.D., D.Sc., F.R.C.P.(Ed.), Physician, Bath and Wessex Orthopaedic Hospital, etc., and M. Forrester Brown, M.D., M.S.(Lond.), Surgeon, Bath and Wessex Orthopaedic Hospital, etc. 328 pages, illustrated. Price \$4.50. Oxford University Press, London; Mc-Ainsh & Co., Toronto, 1933.

This book is not a treatise on neurology, nor is it a work on orthopaedics. It is a commendable attempt to bridge the more or less wide gap between these specialties. It presents a study of various types of paralysis in young patients which have been observed by the authors over a period of eight years. The experience has been wide and varied, and is crystallized into a text that gives real assistance in solving the problems raised by the paralyzed child.

The first section is short. It deals with generalities and gives an excellent summary of essential physiology. The second section is clinical and is illustrated by case histories, complete, with follow-up notes covering long periods. The methods of examination require little or no apparatus, and some of the suggestions regarding the testing of nerve and muscle function in very young patients are ingenious in their simplicity. The criteria upon which the use of physical therapy is indicated in the paralysis of anterior poliomyelitis are plain and sensible. This part of the book is in nineteen short chapters and is followed by

the third section which deals with treatment. Here is given a concise account of re-education of muscles, of hydrotherapy, the correction of contractures, and a synopsis of orthopaedic operations which may be indicated in treatment of certain deformities and disabilities.

The book is well indexed and fully documented. It is adequately illustrated and written in most readable style.

The Science of Radiology. Edited by Otto Glasser, Ph.D., Director, Radiation Research Department, Cleveland Clinic Foundation. 450 pages, illustrated. Price \$4.50. C. C. Thomas, Springfield and Baltimore, 1933.

This volume was produced as part of the first American Congress of Radiology held in Chicago in 1933. The task of its preparation was delegated to the committee on History and Education, under the chairmanship of Dr. Byron H. Jackson. This committee were fortunate enough to obtain the services of Dr. Otto Glasser as editor. The resulting volume, beautifully bound and splendidly illustrated, contains special articles by twenty-six contributors on various aspects of radiology. The various chapters deal with divisions of this young specialty, and are in each case written by an authority whose name is internationally known in relation to the subject discussed by him. The whole book has an historical aspect and in this relation the chapters on Roentgen and that on Pierre and Marie Curie, written by Otto Glasser, may be taken as an index of the ideal aimed at in the production of this excellent production. It is admittedly impossible to condense in one volume even all the high lights of a subject which has already such an extensive literature. The reading of this volume, however, even to those who have attempted to keep abreast of current journal literature, will be a pleasant exercise, for each author has obviously attempted and apparently succeeded in placing in a concentrated form the basic truths and proved facts of this science of radiology. Each article has appended a generous bibliography, and for this reason alone the book is valuable. No discussion of the various chapters is possible because of so much that is excellent; comparison would be futile; each chapter is the result of abstracting a great number of original monographs.

Histology. S. Ramón y Cajal, M.D., (Madrid), F.R.S. (Lond.), LL.D. (Clarke), Director, Royal Cajal Institute for Medical Research. Revised by J. F. Tello-Muñoz, M.D., Professor of Pathology, University of Madrid. 738 pages, illustrated. Price \$8.00. William Wood, Baltimore, 1933.

Everyone interested in medical sciences will welcome a translation of the student's textbook by this illustrious Spanish scientist. This is offered us by the Professor of Pathology of Marquette University Medical School who tells us that he has attempted an almost literal interpretation of the Spanish text and warns us that the phraseology will often appear unusual. This expectation is abundantly justified, and the resultant sacrifice in clarity is enough to cast doubt on the wisdom of the translator's aim at "enriching our histological nomenclature by coining into English many of Prof. Cajal's vivid teaching locutions". This feature and the great emphasis naturally placed on the histology of the nervous system will give rise to different opinions of its value as a student's text.

However, the book possesses certain striking features. The arrangement of the material adequately illustrates what we are told is the system used in the Spanish universities. The first part is devoted to a very complete presentation of the fundamentals of cytology. The cell is studied from the viewpoints of structure, chemical composition, physiology, reproduction, and evolution. Following on this comes the

Halibut or Cod?

§ The question is frequently asked: "What is the difference between halibut liver oil and cod liver oil?" The answer is difficult. Both are fish oils; both contain vitamins A and D.

Halibut Liver Oil, however, cannot be classed as a type of concentrated Cod Liver Oil, because the ratio in which vitamins A and D exist in Halibut Liver Oil is widely different from the ratio usually found in Cod Liver Oil. Halibut Liver Oil should not be considered as "Cod Liver Oil by the drop".

Halibut Liver Oil is relatively very low in vitamin D, though high in vitamin A, and, therefore, cannot be used economically as an anti-rachitic agent.

It is possible that the ratio of these two vitamins, as found in Cod Liver Oil, plays some important part in its therapeutic effectiveness as observed over many years' experience. It may even be possible that there are other factors in Cod Liver Oil, at present unknown, which may account further for its therapeutic value.

Vitamin Concentrates

§ It is easily possible to-day to prepare concentrations of vitamins A and D in almost pure form; for example, a vitamin A concentrate over 95% pure has been prepared with a potency of 2,000,000 units per gram. It is well known, also, that vitamin D in the form of crystalline Calciferol is readily available with a potency of 40,000,000 units per gram.

In our laboratory, we have prepared a concentrate of vitamins A and D, in their natural form, directly from cod liver oil, which would show an activity many times greater than the most extreme claim made for any cod liver oil concentrate or substitute at present offered to the medical profession.

However, we offer a cod liver oil concentrate, under the trade name Alphamette Liquid, with a vitamin potency which clinical experience has shown to be reasonable and practical.

The potency is high enough for every purpose to which vitamin A and D therapy may be applied in medical practice, but it is not so high as to subject patients to the danger of hypervitaminosis.

The capsule form—Alphamettes—represents the vitamin value of three teaspoonfuls of a good type of medicinal cod liver oil, and this potency has also been deliberately selected for the same reasons.

Is the Use of Halibut Liver Oil a Fad?

§ We do not know. The choice, however, rests primarily with the physician, and in our capacity as manufacturing biological and pharmaceutical chemists catering to the profession, we endeavour to supply products which meet the demands of the profession. We, therefore, offer, in addition to Alphamettes (our capsules of cod liver oil concentrate), capsules of Halibut Liver Oil Plain and Halibut Liver Oil 250-D, which conform with the usual standards of potency for these products.

histology of the tissues. The giving of greater weight to the study of the cell is a commendable feature and worthy of imitation.

A great deal of interesting information is scattered throughout, not only of a purely histological nature but also in regard to methods of tissue preparation, and in the form of histological notes. Neurohistology is, of course, exceptionally well treated.

It can be said without reserve that this book will be of great value to many on account of its fresh viewpoint of the subject, its wealth of facts, and its eloquent testimony to the work of the Spanish school.

Lymphatics. Lymph and Tissue Fluid. Cecil K. Drinker, B.S., M.D., Professor of Physiology, and Madeleine E. Field, A.B., Ph.D., Instructor in Physiology, Harvard School of Public Health. 254 pages. Price \$3.00. Williams & Wilkins Co., Baltimore, 1933.

There is in the minds of many medical students a haziness of view in regard to the lymphatics which they retain as long as they have any views at all. Only those who do experimental work or who use special methods ever see any part of the lymphatic system except the thoracic duct and some of the outlying nodes. Consequently there is some excuse for the prevailing haze. The present volume does much towards clearing up this vagueness by defining the problems presented by the lymphatics. That they are absorptive in function is fairly well settled, but there are many things to be found out about this absorptive power. How, for instance, do particles and colloidal solutions reach the interior of the lymph capillaries: what affects their permeability? Then the question of movement of lymph in such regions as the lung is obscure.

We can heartily recommend the present volume for a clear and stimulating presentation of modern views and work on lymphatics.

Outline of Immunity. W. W. C. Topley, M.A., M.D., F.R.C.P., F.R.S., Professor of Bacteriology and Immunology, University of London. 415 pages. Price \$5.50. Ed. Arnold, London; Macmillan Co., Toronto, 1933.

A book which will outline a subject of such complexity as immunity is to be warmly welcomed. But Prof. Topley rightly reminds us that "it (immunity) is a hybrid creature, not quite sure of its true affiliations. It wanders, a little uneasily, between Departments of Pathology, Bacteriology, and Hygiene. At times it makes an attempt—which some of us think misguided—to set up house all by itself." But whatever its nature, there is little doubt that the average general practitioner shies away from the subject of immunity. This is because the exponents of the subjects have been, in Prof. Topley's words, "more than a little incoherent in speech." It is a question whether even yet the terms employed in immunity are not too obscure and cause too much puzzling. Dr. Topley's book gives one the comfortable sense of taking only the best ascertained facts and leaving the theories alone as much as possible. Not that it is easy reading; there is too much packed into it for that. But it may safely be recommended as one of the soundest and most carefully written shorter treatises on immunity which has yet appeared.

To Be or Not to Be. A Study of Suicide. Louis I. Dublin, Ph.D., Third Vice-president and Statistician, and Bessie Bunzel, M.A., Research Assistant, Statistical Bureau, Metropolitan Life Insurance Co. 443 pages. Price \$3.50. Harrison Smith and Robert Haas, New York, 1933.

When Louis Dublin publishes a book on any subject the reader expects to be intrigued by the skill, and almost legerdemain, with which the author ar-

ranges and re-arranges the statistical data at his disposal. This volume is not disappointing. It does exactly what it sets out to do, that is to say, puts "in order material chaotic in its crude state." One is inclined to ask what use it is to know that there is a certain correlation between suicide death rates and economic conditions; that in one year in the United States, 22,000 suicides are recorded, that "out of every one thousand infants born, ten males and three females will eventually take their own lives"; that "more women attempt suicide, but more men than women complete the act", or "that less suicides occur among married persons than among single, widowed or divorced", etc. But, after all, it probably is valuable to have the ground cleared and the facts as to suicide compiled.

A section on the histological background of suicide contains a number of interesting facts not generally known. There are, for instance, certain tribes in widely different geographical areas to whom suicide is unknown; there are others in which it is quite prevalent, perhaps because tribal custom makes of it an honourable or courageous act, or demands it under certain circumstances. The chapters on the legal aspects of suicide with special reference to insurance are timely and indicate the prevalent attitude that suicide is an abnormal reaction almost indicative of "*non compos mentis*," *per se*. They give in some detail the early legal attitude towards self-destruction in Greece and Rome and England. In England, ignominious burial and confiscation of property were statutory penalties until the nineteenth century. In most European countries suicide has been regarded as a crime, although it is said that the French laws after the Revolution gave the right to take one's own life. It is also pointed out that, in the United States, suicide is not a crime.

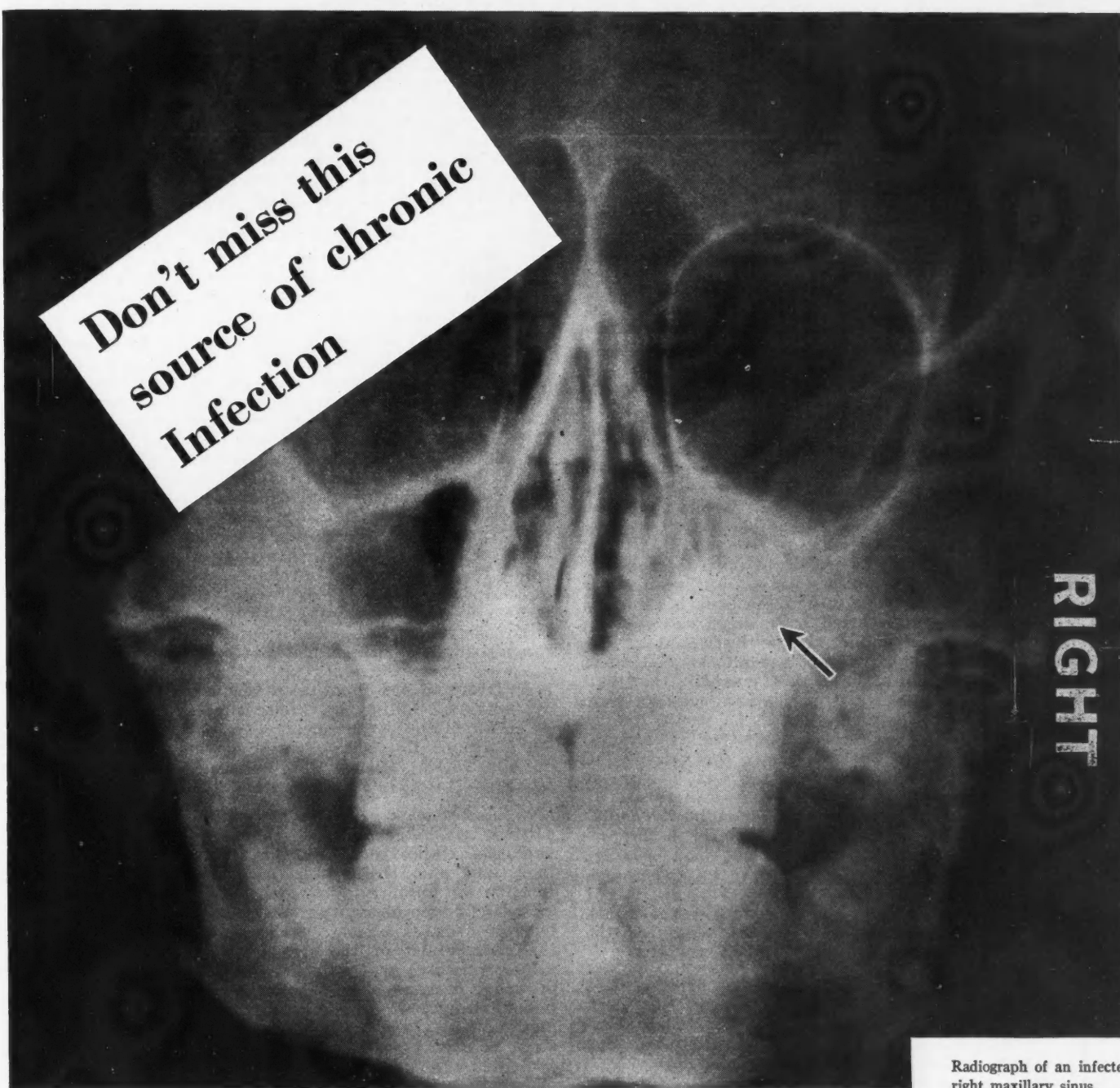
A rather long section on psychological mechanisms smacks roundly of psychoanalysis. As a dissertation on this subject, it is popularly and interestingly presented. As a contribution to the interpretation of suicidal behaviour, however, it seems to leave us where we began. The last chapter on Mental Hygiene is provocative, and is perhaps the most constructive in its suggestions.

The Physician's Art. Alexander George Gibson. 237 pages. Price \$2.25. Oxford, at the Clarendon Press; Oxford University Press, Toronto, 1933.

In 1669 John Locke, the physician-poet-philosopher, wrote a brief treatise, entitled *De Arte Medica*, which, unfortunately, he did not complete. From this we gather that his analytical mind led him to anticipate the betterment of the art of medicine by a closer union of principles with clinical practice. Had he carried out his plan to formulate a system for medicine, Doctor Gibson thinks "he would have attempted to determine and criticize the larger principles of the art as they have appeared to the reflective physician of every age—principles that are not dependent on the state of the science of medicine." Doctor Gibson reprints Locke's fragment and devotes the substance of his own contribution to what he conceives to be the fundamentals of the medical art, basing his thesis on the same conception that Locke puts forward, but without any intent to expand Locke's thought. A good idea of Doctor Gibson's treatment of his subject can be gathered from the titles of his chapters. He deals in his introductory chapter with the pertinent details of Locke's life, and discusses the *De Arte Medica* in a sympathetic manner; then prints Locke's production. This is followed by chapters entitled Art and Science, Of Diagnosis, Of Prognosis, Of Treatment, The Ethics and Management of Practice, Of the Doctor Himself, and Optimism.

Doctor Gibson is a physician and pathologist, a teacher also in a noted school of medicine; it is clear, from his book, that he possesses the analytical and

Don't miss this
source of chronic
Infection



Radiograph of an infected
right maxillary sinus.

CHRONIC sinusitis often causes perplexing symptoms of disorders in unrelated organs. Among the most common are disturbances of the respiratory and gastro-intestinal systems. Particularly in children, such conditions can be produced by the aspiration or swallowing of pus from infected sinuses.

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reflective mind that eminently qualifies him for his task. Other works have been written to provide the physician with a chart for his conduct, all excellent in their way, but none, save certain essays of Osler's, reach the high ethical plane of Doctor Gibson's little book. It is the production, clearly, of an excellent clinician, a scholar and a philosopher. Altogether, it makes delightful and profitable reading; observation is keen, quotations apt, and conclusion sound. The chapters on Art and Science, Prognosis, and the Ethics and Management of Practice are particularly good, where all are noteworthy. Everyone should possess this book.

Report to United States Government on Tuberculosis, with Some Therapeutic and Prophylactic Suggestions. S. Adolphus Knopf, M.D., 59 pages, illustrated. Price \$1.15. Published by National Tuberculosis Association, New York, 1933.

This report covers two points: (1) a report on the Eighth Conference of the International Union Against Tuberculosis; (2) a study of the general care of tuberculous war veterans in England, France and Germany. The three subjects dealt with at the general scientific sessions of the conference were: "Relations between Allergy and Immunity", "Gold Therapy", and "The After-Care of the Tuberculous." The first is condensed into seven lines, the second is given a few pages. The rest of the book is taken up with the third, interspersed with which are observations by the author on various institutions. The author gives considerable prominence to his method of diaphragmatic respiration as an adjuvant in the treatment of pulmonary tuberculosis, and one can only hope that it accomplishes all that he would like us to think it does. For example, he says: "The therapeutic effect of such exercises on the actively ill patient with pulmonary tuberculosis, first, consists of the combat of anaemia so prevalent in this disease by an increase in erythrocytes and, secondly, by an increase in the lymph flow which is helpful in the production of antigens." Just how red blood cells are increased by this means is not easy to understand. It is one of those things we can only hope Dr. Knopf is right in describing. A similar degree of blind faith must be extended to the statement regarding the lymph and the production of antigens.

Dietetics for the Clinician. Milton A. Bridges, B.S., M.D., F.A.C.P., Associate in Medicine at New York Post-Graduate Medical School, Columbia University, N.Y., and Ruth L. Gallup, Dietitian. 666 pages. Price \$6.50. Lea & Febiger, Phila., 1933.

The author presents the modern knowledge of dietetics in a simple and practical manner which should commend itself to both the student and practitioner. There is a cursory review of metabolism, followed by a concise discussion of all the known food factors and their function. Acceptable dietetic therapy for nearly every disease from birth to old age is then outlined. This is in sufficient detail to be easily followed. In many instances menus and recipes are given. The food tables are abundant and adequate. The bibliography is good.

Index Veterinarius. Vol. 1, No. 1. Annual subscription, £4. Imperial Bureau of Animal Health, Weybridge, Eng., 1933.

This volume, produced on a duplicator, contains references to a wide range of subjects dealt with in articles published during the first quarter of 1933. It is to be followed by others in series. Each quarterly issue will be a single complete alphabetical index. The full details of the reference are set out under the name of the author in the following order:— name of author; year of publication; full title in the language of origin, an English translation in the case of languages other than French and German; origin,

with relevant details, volume. This production, which bears evidence of an enormous amount of work, will be invaluable to all research-workers, to medical men as well as veterinarians, because the work of the student of infections in the human being is so often linked up with the subject of disease in the lower animals. This work should be in every veterinary institution and in every medical library.

Human Embryology and Morphology. Sir Arthur Keith, M.D., F.R.S., LL.D., D.Sc., F.R.C.S.(Eng.), Master of the Buckston Browne Research Farm. Fifth edition, 558 pages, illustrated. Price \$10.75. Ed. Arnold, London; Macmillan Co., Toronto, 1933.

This is the fifth edition of a notable text book, the last print appearing in 1923. As with previous editions, one can only add a word of commendation for this book to those who desire a practical treatise which may be used for everyday reference. As is stated by the author the book was originally prepared for the student, and the subject matter was chosen on the basis of its clinical utility. With the passing years considerable new substance has been added to the volume whereby broader topics were introduced, when satisfactory information concerning the growth and development of the human body was made available. The embryological development of the body and its component parts is dealt with in a very logical fashion and not encumbered with too much specialized terminology. It is eminently practical and can be recommended to both student and practitioner.

A Textbook of the Practice of Medicine. By various authors. Edited by Frederick W. Price, M.D., F.R.S.(Edin.), Consulting Physician to Royal Northern Hospital. Fourth edition, 1995 pages; illustrated. Price \$10.75. Oxford University Press, London; McAinsh & Co., Toronto, 1933.

This textbook maintains its popularity. Its third edition was noted in these columns in April, 1930, page 604. Since then there have been two re-printings, and now a fourth edition is presented. It remains an authoritative textbook of practice, and includes dermatology, psychological medicine and tropical diseases. Some changes have been made in the arrangement of the sections. For example, deficiency diseases appear in a separate section instead of under diseases of metabolism. There are certain minor changes in nomenclature, while some major sections have been largely or wholly re-written. A large number of new articles have been added, incorporating the advances of knowledge in medicine and bringing the whole work up to date. One must remark upon the admirable balance the editor has achieved in a work which has been written by so many collaborators. It is a credit to the London School of Medicine, and will be found a most valuable work by all who are reading and practising medicine, student, teacher, consultant, and general practitioner.

Text-book of Medicine. By American authors. Third ed. revised and reset by R. L. Cecil, A.B., M.D., Sc.D., Prof. of Clinical Medicine, Cornell University. 1664 pages; illustrated. Price \$10.00. W. B. Saunders, London and Phila.; McAinsh & Co., Toronto, 1933.

It is not so easy nowadays for one man to write a comprehensive text-book of medicine. Indeed, it may be said that if such a book is to be of solid worth it must not be written by one man alone. The text-book under review avoids this difficulty by having many contributors, each of whom is particularly interested in his own subject. Careful editing is necessary to give such a book some kind of uniformity of outlook and this has been well done by Dr. Cecil. Some idea of the effort to include the latest developments in medicine may be gathered from the list of

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new chapters added in this edition. These include such subjects as rat-bite fever, the erythemas, poisoning by radioactive substances, hypotension, diseases of the pituitary body, etc.

The writing itself is careful and along the most approved lines of conciseness and clarity. The book can be definitely recommended as a reliable and comprehensive guide.

Metabolic Diseases and Their Treatment. Erich Grafe, Prof. of Medicine, University of Würzburg, Germany. Translated by Margaret Galt Boise, under the supervision of E. F. DuBois, M.D., Medical Director, Russell Sage Institute of Pathology, and H. B. Richardson, M.D., Assoc. Prof. of Medicine, Cornell University, New York. 551 pages; illustrated. Price \$6.50. Lea & Febiger, Phila., 1933.

Diseases of metabolism now form an important part of medical practice, very largely because we are able to help the sufferer; and so an authoritative work such as this is gladly welcomed. With Teutonic thoroughness Grafe takes up the various disorders of nutrition, and disturbances of carbohydrate, protein and mineral metabolism, so that in less than 550 pages we have a full account of all that is worth-while. The sections on obesity and diabetes are masterpieces, equal to anything that has been previously published, and having the present advantage of being the last word. One cannot resist the sanity of his therapeutics, founded on his own experience. His chemical training has not made him a nihilist, nor has it left him a man of fanatical faith in the unseen. When he has not used a drug, he frankly says so, but reports what has been stated by others.

The translation from the German has been done so well that it is difficult to lay the book down. It is rather unfortunate, however, that the American authors use the word "régime" where they mean "regimen".

In this excellent work, every question that can be raised on metabolism is fully answered. It is really several monographs in one volume, and should find a place in every working library.

Handbook of Psychiatry. John H. Ewen, M.R.C.P. (Edin.), D.P.M., Ass't. Medical Officer, Surrey County Mental Hospital, Netherne. 267 pages. Price \$3.75. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1933.

In his preface the author states that this is "an attempt to present in a synoptical form those principles of psychiatry that are of importance at the present time and to epitomise the more recent knowledge in this branch of medicine." It is to be borne in mind that this is in no sense a text-book and would prove disappointing to any who might expect to use it as such. Any epitome—in any case one dealing with a subject such as psychiatry—is practically certain to be an uncomfortable book. The inevitable arrangement, i.e., long series of headings arranged 1, 2, 3, etc., up to 10 or more, or a, b, c, to "j" and beyond, is sufficient to daunt anyone not possessed of a prodigious memory. A valiant attempt to cover the entire field is made, but one notes a distinct straining to take in too many opinions, many of scant value or interest. Obviously, too, one would require a considerable knowledge of the subject to begin with, since under many headings there are lists of unconnected terms, intelligible enough to the well-versed, but surely capable of misconstruction by and mystification to others. Quite a number of faultily constructed statements are noted. For example, "Marriage with a lunatic by legal inquisition is null and void", does not seem quite right. The chapter on "Certification" is a good exposition of procedure in Great Britain. To those in other parts of the world it will be interesting, but not very useful. Proof reading has

been bad and some inexcusable errors have been passed uncorrected. As an aid to hurried review, the book has the usual value of an epitome.

Pathogenic Microorganisms. William H. Park, M.D., Prof. of Bacteriology and Hygiene, University and Bellevue Hospital Medical College, and Anna W. Williams, M.D., Ass't. Director of Bureau of Laboratories of Dept. of Health, New York. Tenth edition; 807 pages; illustrated. Price \$7.00. Lea & Febiger, Phila., 1933.

As a practical manual of reference for practitioners and students alike this book stands very high. Dr. Park's experience in bacteriological problems is widened and enriched by his no less extensive grasp of public health questions, so many of which are inseparably bound up with bacteriology. The present volume is completely revised and brought up to date, and the task of doing this, in view of the advances being made, is no light one. The illustrations are unusually good, not only the colour plates, but the numerous half-tone productions.

The Technique of Local Anæsthesia. Arthur E. Hertzler, A.M., M.D., Ph.D., LL.D., F.A.C.S., Professor of Surgery, University of Kansas. Fifth ed., 292 pages; illustrated. Price \$6.00. C. V. Mosby Co., St. Louis; McAinsh & Co., Toronto, 1933.

This practical work on local anæsthesia has already passed through four editions and now a fifth has been called for. The last edition was reviewed in this *Journal*. The present edition has been well revised, and the chapter on spinal anæsthesia has been re-written, while a chapter on intravenous anæsthesia has been added. For very sound reasons the author advocates infiltrative rather than regional blocking for the production of local anæsthesia. The text of this volume is clearly expressed, and there is an abundance of good illustrations. This work should continue to find favour with surgeons.

BOOKS RECEIVED

Die Lungentuberkulose. Prof. Dr. Hans Dietlen, Hamburg. Medizinische Praxis, vol. 16. 142 pages. Price 8RM. Theodor Steinkopff, Dresden and Leipzig, 1934.

Erkrankungen des Herzmuskels und der Herzklappen. A Symposium at Bad Oeynhausen. 94 pages. Price 5RM. Theodor Steinkopff, Dresden and Leipzig, 1933.

Aids to Sanitary Science and Law. C. F. White, M.B., Ch.B., D.P.H., D.T.M., Medical Officer of Health, Port of London. Second ed., revised by H. Willoughby, M.R.C.S., L.R.C.P., D.P.H., D.T.M. & H., Surgeon-Lieut. Commander, R.N.V.R. 321 pages. Price \$1.35. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1934.

Urinary Infections. Clifford Morson, O.B.E., F.R.C.S., Surgeon to St. Peter's Hospital for Urinary Diseases. 76 pages. Price \$0.90. John Bale, Sons & Danielsson, London; Macmillan Co., Toronto, 1933.

Aids to Neurology. E. A. Blake Pritchard, M.A., M.D., M.R.C.P., Assistant Physician, Hospital for Epilepsy and Paralysis, Maida Vale. 376 pages. Price \$1.65. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1934.

Outline of Practical Obstetrics for Nurses. R. S. S. Statham, O.B.E., M.D., Ch.M., F.C.O.G., Prof. of Obstetrics, University of Bristol. 139 pages. Price \$0.85. John Wright & Sons, Bristol; Macmillan Co., Toronto, 1933.

